Corbettmaths

Ultimate GCSE Foundation Revision Question Booklet

Revision Video

Answers

Contents

Words and Figures - Videos 362, 363

1. Write the number 981 in words.

Nine hundred and eighty-one

2. Write the number 3104 in words.

Three thousand, one hundred and four

3. Write the number **eighteen thousand and thirty-two** in figures

18032

4. Write the number **nine million** in figures

9000000

Addition - Video 6

5. Work out 345 + 77

$$\begin{array}{r} 345 \\ +\ 77 \\ \hline 422 \\ {\scriptstyle 1\ 1} \end{array}$$

422

6. Find the sum of 522 and 193

$$\begin{array}{r} 522 \\ +\ 193 \\ \hline 715 \\ {\scriptstyle 1\ 1} \end{array}$$

715

Subtraction - Video 304

7. Find the difference between 85 and 26

$$\begin{array}{r} {\scriptstyle 7}\not{8}{\scriptstyle 1}5 \\ -\ 26 \\ \hline 59 \end{array}$$

59

8. Work out 415 – 132

$$\begin{array}{r} {\scriptstyle 3}\not{4}{\scriptstyle 1}15 \\ -\ 132 \\ \hline 283 \end{array}$$

283

Multiplication - Video 200

9. Work out 17 x 8

$$\begin{array}{r} 17 \\ \times\ 8 \\ \hline 136 \end{array}$$

136

10. Find the product of 126 and 5

$$\begin{array}{r} 126 \\ \times\ 5 \\ \hline 630 \\ {\scriptstyle 2} \end{array}$$

630

11. Shannon does 15 press-ups each day in January.
Work out how many press-ups Shannon does in January.

$$\begin{array}{r} 31 \\ \times\ 15 \\ \hline 155 \\ +\ 310 \\ \hline 465 \end{array}$$

465

Division - Video 98

12. Work out $426 \div 3$

$$3\overline{)426} = 142$$

142

13. 288 guests attend a wedding.
Each table at the wedding will sit 8 guests.
How many tables are needed?

$$8\overline{)288} = 36$$

36

14. A group of 12 friends share £192 equally.
How much money does each friend get?

$$12\overline{)192} = 16$$

£16

Order of Operations - Video 211

15. Calculate the value of $75 - 15 \times 3$

$75 - 45 = 30$

30

Rounding - Videos 276, 277a, 277b, 278, 279a

16. Round 64 to the nearest ten

60

17. Round 752kg to the nearest hundred kilograms.

800kg

18. Round £128.32 to the nearest £10

£130

19. Round 9311 to the nearest 100

9300

20. Round 47638 days to the nearest thousand days

48000 days

21. Round 5.27 to the nearest tenth

5.3

22. Write 1373 correct to 1 significant figure

1000

Rounding (Highest/Lowest) - Video 280

There are 300 jelly beans in a jar to the nearest hundred.

23. Write down the lowest possible number of jelly beans in the jar.

250

24. Write down the greatest possible number of jelly beans in the jar.

349

Estimation - Video 215

25. A school hall has 18 rows of 31 chairs.

≈ 20 × 30

Estimate how many chairs there are.

20 × 30 = 600

600

26. Estimate the value of $\frac{49.1 \times 40.4}{9.05 - 5.1}$

$\approx \frac{50 \times 40}{9 - 5} = \frac{2000}{4} = 500$

500

Ordering Decimals - Video 95

27. Arrange in order, starting with the smallest.

6.25 6.2 6.18 6.08 6.1

6.08, 6.1, 6.18, 6.2, 6.25

28. Arrange in order, starting with the largest.

2.21 2.3 2.029 2.15 2.136

2.3, 2.21, 2.15, 2.136, 2.029

Arithmetic with Decimals - Videos 90, 91, 92, 93, 94

29. Work out 6.15 + 2.47

$$\begin{array}{r} 6.15 \\ +\ 2.47 \\ \hline 8.62 \end{array}$$

8.62

30. Work out 7.3 – 2.54

$$\begin{array}{r} {}^{6}\not{7}^{1}.{}^{2}\not{3}^{1}0 \\ -\ 2.54 \\ \hline 4.76 \end{array}$$

4.76

31. Work out 0.9 x 0.2

0.18

32. Work out $74.5 \div 5$

$$5\overline{)74.5} = 14.9$$

14.9

33. Work out $14 \div 0.2$

$140 \div 2 = 70$

70

Ordering Negative Numbers - Video 208
Real-Life Negatives - Video 209

34. Arrange these temperatures in order, starting with the coldest.

-6°C, -3°C, 11°C, -8°C, 2°C

-8°C, -6°C, -3°C, 2°C, 11°C

35. Shown below are the elevations of 6 locations.

Location	Elevation
Coachella	-22 metres
Bern	542 metres
Jericho	-258 metres
Baku	-28 metres
Lake Eyre	-16 metres
Tokyo	17 metres

Which location has the lowest elevation?

Jericho

Addition & Subtraction involving Negative Numbers - Video 205

36. $3 - 5 =$ [-2]

37. $-4 + 10 =$ [6]

38. $-20 - 3 =$ [-23]

39. $9 + (-2) =$ [7]

40. $4 - (-2) =$ [6]

41. $-8 + (-3) =$ [-11]

Multiplication & Division involving Negative Numbers - Videos 206, 207

42. $6 \times -2 =$ [-12]

43. $-5 \times 5 =$ [-25]

44. $-10 \times -3 =$ [30]

45. $-32 \div -4 =$ [8]

46. $-18 \div 2 =$ [-9]

47. $49 \div -7 =$ [-7]

Place Value - Video 222

48. Write down the value of the digit 6 in the number 5619

600

49. Write down the value of the digit 2 in the number 1.28

0.2

Inequality Sign - Video 176

50. Write the correct symbol, > or < in each box to make the statement correct.

91 [<] 96 146 [>] 142 0.5 [>] 0.39

Place Value (using calculations) - Video 222a

Given that $83 \times 177 = 14691$

51. Write down the answer to $14691 \div 177$

83

52. Write down the answer to 830×1770

1469100

Multiples - Video 220

53. List the first ten multiples of 3

3 6 9 12 15 18 21 24 27 30

54. List the first five multiples of 15

15 30 45 60 75

Common Multiples - Video 218

55. Write down three common multiples of 4 and 6

4 8 12 16 20 24 28 32 36
6 12 18 24 30 36

12, 24, 36

Factors - Video 216

56. List the factors of 18 1x18 2x9 3x6

1 2 3 6 9 18

57. List the factors of 40 1x40 2x20 4x10 5x8

1 2 4 5 8 10 20 40

Common Factors - Video 219

58. Find the common factors of 16 and 20

16: (1), (2), (4), 8, 16
20: (1), (2), (4), 5, 10, 20

1, 2, 4

LCM/HCF - Videos 218, 219

59. Find the lowest common multiple of 12 and 15

12 24 36 48 (60)
15 30 45 (60)

60

60. Find the highest common factor of 18 and 45

(1) 2 (3) 6 (9) 18
(1) (3) 5 (9) 15 45

9

Prime Numbers - Video 225

61. Is 15 a prime number? Yes ☐ No ☑

62. Is 13 a prime number? Yes ☑ No ☐

63. List the first 5 prime numbers

2, 3, 5, 7, 11

Square Numbers - Video 226

64. Is 36 a square number? Yes ☑ No ☐

65. Is 10 a square number? Yes ☐ No ☑

66. List the first 10 square numbers

1 4 9 16 25 36 49 64 81 100

Squaring Numbers - Video 227

67. Work out 20^2

$20 \times 20 = 400$

400

68. Calculate 37^2

1369

Square Roots - Video 228

69. Find the square root of 81

$\sqrt{81} = 9$

9

70. Calculate $\sqrt{1225}$

35

Cube Numbers - Videos 212, 213

71. Is 100 a cube number? Yes ☐ No ☑

72. Is 64 a cube number? Yes ☑ No ☐

73. List the first 5 cube numbers

1 8 27 64 125

Cube Roots - Video 214

74. Find the cube root of 27

$\sqrt[3]{27}$

3

75. Calculate $\sqrt[3]{8000}$

20

Indices - Video 172

76. Work out 2^4

$2 \times 2 \times 2 \times 2$

16

77. Calculate 9^4

6561

78. Write $6 \times 6 \times 6 \times 6 \times 6$ in index form

6^5

Laws of Indices - Video 174

79. Write $2^3 \times 2^5$ in the form 2^n

2^8

80. Write $5^{10} \div 5^2$ as a single power of 5

5^8

81. Write $(10^6)^2$ in the form 10^n

10^{12}

Negative Indices - Video 175

82. Work out 5^{-2}

$\frac{1}{5^2} = \frac{1}{25}$

$\frac{1}{25}$

83. Work out 10^{-3}

$\frac{1}{10^3} = \frac{1}{1000}$

$\frac{1}{1000}$

Product of Primes - Video 223

84. Write 20 as a product of primes.
Give your answer in index form.

20 → 2, 10 → 2, 5

$2 \times 2 \times 5$

$2^2 \times 5$

85. Write 48 as a product of primes.
Give your answer in index form.

48 → 2, 24 → 2, 12 → 2, 6 → 2, 3

$2 \times 2 \times 2 \times 2 \times 3$

$2^4 \times 3$

86. When a number is written as a product of primes, the answer is $2^2 \times 3^2 \times 5$
What was the number?

180

Applying Product of Primes - Video 223a

87. A number, y, written as a product of primes is 5×7^2
Write the number 14y as a product of primes.

$14 = 2 \times 7$

$14y = 5 \times 7^2 \times 2 \times 7$

$= 2 \times 5 \times 7^3$

$2 \times 5 \times 7^3$

88. Given that $120 = 2^3 \times 3 \times 5$

Find the lowest whole number that 120 would need to be multiplied by to give a cube number.

$2^3 \times 3^3 \times 5^3$ is a cube number.

$3^2 \times 5^2 = 225$

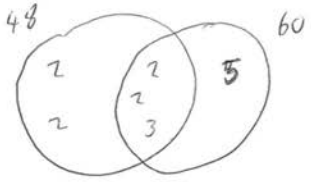
225

Product of Primes - LCM/HCF - Video 224

89. Find the HCF and LCM of 48 and 60

$48 = 2 \times 2 \times 2 \times 2 \times 3$

$60 = 2 \times 2 \times 3 \times 5$



HCF = 12

$HCF = 2 \times 2 \times 3 = 12$

$LCM = 2 \times 2 \times 2 \times 2 \times 3 \times 5 = 240$

LCM = 240

Standard Form - Videos 300, 301, 302, 303

90. Write 700000 in standard form

7×10^5

91. Write 28000 in standard form

2.8×10^4

92. Write 0.094 in standard form

9.4×10^{-2}

93. Write 1.7×10^4 as an ordinary number

17000

94. Write 9.2×10^{-3} as an ordinary number.

0.0092

95. Write 450×10^5 in standard form.

4.5×10^7

96. Work out $(3.8 \times 10^5) + (1.9 \times 10^6)$

$$\begin{array}{r} 1\,9\,0\,0\,0\,0\,0 \\ +\;\;3\,8\,0\,0\,0\,0 \\ \hline 2\,2\,8\,0\,0\,0\,0 \end{array}$$

2.28×10^6

97. Work out $(6 \times 10^3) \times (4 \times 10^5)$
Give your answer in standard form.

24×10^8

2.4×10^9

2.4×10^9

98. Work out $(4 \times 10^9) \div (5 \times 10^{-2})$
Give your answer in standard form.

0.8×10^{11}

8×10^{10}

8×10^{10}

Fractions of Amounts - Video 137

99. Work out $\frac{3}{4}$ of 200

$200 \div 4 = 50$

$50 \times 3 = 150$

150

100. There are 30 students in a class

$\frac{2}{5}$ of the students cycle to school

How many students cycle to school?

$30 \div 5 = 6$

$6 \times 2 = 12$

12

Expressing as a Fraction - Video 136

101. A box contains 20 counters.
Some of the counters are red and the rest are white.
There are 7 white counters in the box.

What fraction of the counters in the box are red?

$20 - 7 = 13$

$\frac{13}{20}$

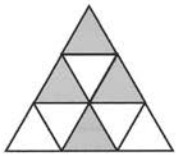
102. Write 50p as a fraction of £2
Give your answer in its lowest terms.

$\frac{50}{200} = \frac{5}{20} = \frac{1}{4}$

$\frac{1}{4}$

Fractions of Shapes - Video 143

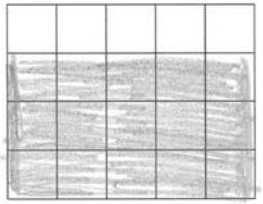
103. Write down the fraction of the shape that is shaded.



4/9

4/9

104. Shade in $\frac{3}{4}$ of the grid.



Simplifying Fractions - Video 146

105. Simplify $\frac{6}{10}$

3/5

106. Simplify $\frac{20}{30}$

2/3

107. Simplify $\frac{21}{28}$

3/4

Equivalent Fractions - Video 135

108. $\frac{3}{4} = \frac{6}{8}$ (×2)

109. $\frac{2}{5} = \frac{6}{15}$ (×3)

110. $\frac{4}{8} = \frac{1}{2}$ (÷4)

Ordering Fractions - Video 144

111. Arrange these fractions in order, smallest first.

$\frac{7}{15}$ $\frac{3}{10}$ $\frac{2}{5}$ $\frac{1}{3}$

14/30 9/30 12/30 10/30

3/10, 1/3, 2/5, 7/15

Adding & Subtracting Fractions - Video 133

112. Work out $\frac{5}{8} + \frac{1}{3}$

15/24 + 8/24 = 23/24

23/24

113. Work out $\frac{7}{15} - \frac{3}{10}$

14/30 - 9/30 = 5/30

1/6

114. Work out $5\frac{1}{4} + 1\frac{2}{5}$

$\frac{21}{4} + \frac{7}{5}$

$\frac{105}{20} + \frac{28}{20} = \frac{133}{20}$

$6\frac{13}{20}$

Multiplying Fractions - Video 142

115. Work out $\frac{1}{2} \times \frac{2}{3}$ $= \frac{2}{6}$

$\frac{1}{3}$

116. Work out $\frac{3}{8} \times 1\frac{2}{5}$

$\frac{3}{8} \times \frac{7}{5} = \frac{21}{40}$

$\frac{21}{40}$

Dividing Fractions - Video 134

117. Work out $\frac{3}{4} \div \frac{9}{10}$

$\frac{3}{4} \times \frac{10}{9} = \frac{30}{36}$

$= \frac{5}{6}$

$\frac{5}{6}$

Reciprocals - Video 145

118. Write down the reciprocal of 20

$\frac{1}{20}$

119. Write down the reciprocal of $\frac{1}{5}$

5

120. Write down the reciprocal of $\frac{3}{8}$

$\frac{8}{3}$ or $2\frac{2}{3}$

121. Write down the reciprocal of $7\frac{1}{2}$

$\frac{15}{2} \rightarrow \frac{2}{15}$

$\frac{2}{15}$

Fractions, Decimals and Percentages - Videos 129, 130

122. Fill in the missing values

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$	0.25	25%
$\frac{1}{5}$	0.2	20%
$\frac{1}{10}$	0.1	10%

123. Tick **two** numbers that are equivalent to $\frac{3}{5}$

35% ☐ $\frac{30}{50}$ ☑ 0.35 ☐ 0.6 ☑

Expressing as a Percentage - Video 237

124. Josie scored 19 out of 20 in a test.

Write Josie's result as a percentage.

$\frac{19}{20} = 0.95$

or $\frac{19}{20} = \frac{95}{100}$

95 %

125. There are 29 students in a class.
6 of the students are left handed.

What percentage of the class are left handed?
Give your answer to 1 decimal place.

$\frac{6}{29} = 0.206896...$

$20.6896...\%$

20.7 %

Percentages of Amounts (Non-Calculator) - Video 234

126. Work out 50% of 18

9

127. Work out 10% of 350

35

128. Work out 25% of 32

8

129. Decrease 90 by 30%

10% → 9

30% → 27

90 − 27 = 63

63

130. Work out 175% of 60

50% of 60 = 30

25% of 60 = 15

75% of 60 = 45

60 + 45

105

Percentages of Amounts (Calculator) - Video 235

131. Work out 3% of 2800

2800 ÷ 100 = 28

28 × 3 = 84

or 2800 × 0.03 = 84

84

132. Work out 34% of 700

700 ÷ 100 = 7

7 × 34 = 238

700 × 0.34 = 238

238

Percentage Change - Video 233

133. Eoin bought an antique for €35
He sold the antique for €49

Work out the percentage profit

$\frac{14}{35} = \frac{2}{5}$

40 %

134. Last year, a football team sold 800 season ticket
This year, the team sold 745 season tickets

Calculate the percentage decrease.

$\frac{55}{800} = 0.06875$

6.875 %

Simple Interest - Video 236a

135. Niamh invests £500 for 2 years at 3% simple interest.
Work out how much interest Niamh earns at the end of the 2 years.

3% of £500 = £15

15 × 2 = £30

£ 30

Multipliers - Video 239

136. Increase 120 by 10%

120 × 1.1 = 132

132

137. Decrease 60 by 25%

60 × 0.75 = 45

45

Compound Interest - Video 236

138. Fiona leaves £1600 in the bank for three years.
It earns compound interest of 4% each year.

Calculate the total amount Fiona has in the bank at the end of the three years.

$1600 \times 1.04^3 = £1799.78$

£ 1799.78

Reverse Percentages - Video 240

139. The price of a chair is reduced by 20% in a sale.
The sale price of the chair is £20.80

0026
80 ⟌ 2080
220 48

What is the normal price of the chair?

80% → £20.80
1% → £0.26
100% → £26

£ 26

140. A limited edition bag of sugar contains 35% more than a standard bag.
The limited edition bag contains 702g of sugar.

How much sugar is in the standard bag?

702 ÷ 1.35 = 520g

or

135% → 702
1% → 5.2
100% → 520

520 g

Simplifying Ratios - Video 269

141. Maisie makes 8 chocolate cupcakes and 22 lemon cupcakes.

Write down the ratio of chocolate to lemon cupcakes in its simplest form.

8 : 22
4 : 11

4 : 11

142. Logan has 80p and Sam has £2

Write down the ratio of how much money Logan has to how much money Sam has.
Give your answer in its simplest form.

80 : 200
8 : 20
4 : 10
2 : 5

2 : 5

Ratio: 1:n or n:1 - Video 271c

There are 180 red pens and 40 black pens in a box.

143. Write down the ratio of red pens to black pens in the box.
Give your answer in the form n : 1

÷40 (180 : 40) ÷40

4.5 : 1

4.5 : 1

Forming Ratio - Video 271c

2x x 6x

In a bag, there are red, yellow and blue sweets.
There are twice as many red sweets as yellow sweets.
There are three times as many blue sweets as red sweets.

144. Write down the ratio of the number of red sweets : yellow sweets : blue sweets

2 : 1 : 6

2 : 1 : 6

Ratio & Fractions - Video 269a

The ratio of red to white counters in a bag is 3:5

145. What fraction of the counters are red?

3/8

146. What percentage of the counters are white?

5/8 = 0.625
62.5%

62.5%

147. Mark says that there are 72 counters in the bag.
Could Mark be correct?

3+5 = 8
72 ÷ 8 = 9

Yes

Sharing in a Ratio - Video 270

148. The ratio of adults to children on a flight is 17:3
There are 160 people altogether on the flight.

How many children are on the flight?

$17 + 3 = 20$

$160 \div 20 = 8$

$17 \times 8 = 136$

$3 \times 8 = 24$

24

Given One Quantity - Video 271

149. The ratio of the size of angle A to angle B is 4:9
Angle B is 72°

Find the size of angle A.

$72 \div 9 = 8$

$8 \times 4 = 32$

32 °

Given Two Ratios - Video 271a

150. Given that a : b = 2 : 3 and b : c = 5 : 1

Find a : b : c

a : b : c

2 : 3

5 : 1

×5 ×3

10 : 15 : 3

10 : 15 : 3

Ratios and Equations - Video 271a

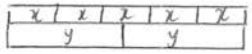
151. y : x = 5 : 1

Write an equation linking x and y.

$y = 5x$

152. x : y = 2 : 5

Write an equation linking x and y.



$2y = 5x$

$y = \frac{5}{2}x$

$y = \frac{5}{2}x$

153. y = 3x

Write the ratio x : y

$y : x$

$3 : 1$

$x : y$

$1 : 3$

1 : 3

Unitary Method - Video 255a

154. 28 marbles have a mass of 91g.

What is the mass of 100 marbles?

$91 \div 28 = 3.25g$

$3.25 \times 100 = 325g$

325 g

Exchange Rates - Video 214a

155. Orla went to Spain.
She changed £425 into euros (€).

The exchange rate was £1 = €1.16

Change £425 into euros.

$425 \times 1.16 = 493$

€493

€ 493

156. On her return to Belfast, Orla changed €80 into pounds (£).

The new exchange rate was £1 = €1.25

Change €80 into pounds.

$80 \div 1.25 = 64$

£ 64

Recipes - Video 256

157. Rebecca is making chilli con carne.
Here is a list of ingredients to serve 6 people.

÷6 → 1 person → ×4 → 4 people

serves 6	1 person	4 people
1.2kg mince	0.2kg	0.8kg
420g tomatoes	70g	280g
3 chillies	½	2
600g kidney beans	100g	400g

How much of each ingredient does Rebecca need for 4 people?

Mince 800g (or 0.8kg)

Tomatoes 280g

Chillies 2

Kidney beans 400g

Proportion - Video 254

158. The number of months, m, to complete a piece of research is found by $m = \frac{400}{n}$

where n is the number of scientists working on the research.

How long should the research take if 8 scientists are working on it?

$m = \frac{400}{8} =$

50 months

Direct Proportion - Video 254

159. y is directly proportional to x

Circle the equation the correct equation.

$y = \frac{k}{x}$ $y = \frac{x}{k}$ $y = kx$

Inverse Proportion - Video 254

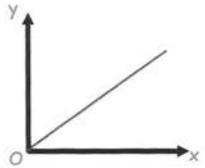
160. y is inversely proportional to x

Circle the equation the correct equation.

$y = \frac{k}{x}$ $y = \frac{x}{k}$ $y = kx$

Proportion Graphs - Video 254

161. Sketch the graph of y is directly proportional to x.



Proportion: Time - Video 255c

It takes 5 builders, 8 days to build a wall. $5 \times 8 = 40$

162. How long would it take 2 builders?

1 builder → 40 days
2 builders → 20 days

20 days

163. State an assumption that you have made in working out your answer.

All builders work at the same rate.

Money - Video 400

164. Emily buys a new TV.
The TV costs £460
She pays a deposit of £190 and then pays 10 equal monthly payments.

How much is each monthly payment?

$460 - 190 = £270$

$£270 \div 10 = £27$

£ 27

Best Buys - Video 210

165. A shop sells the same type of highlighter in two different packs.
Pack A has 6 highlighters and costs £3.50
Pack B has 9 highlighters and costs £5.30

Which pack is better value for money?

18 highlighters Pack A: $3.50 \times 3 = £10.50$
Pack B: $5.30 \times 2 = £10.60$

Pack A

Use of a Calculator - Video 352

166. Calculate the value of $\frac{5}{0.8^3}$

9.765625

167. Calculate the value of $\frac{\sqrt{9 \times 0.13}}{9.11 + 2.9}$

0.090063728 78

Error Intervals - Video 377

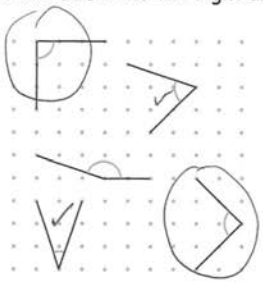
168. Jessica rounds a number, y, to the nearest hundred.
Her result is 2800.

Write down the error interval for y.

$2750 \leq y < 2850$

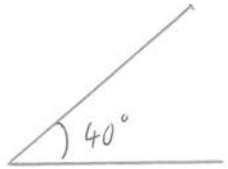
Types of Angle - Video 38

169. **Tick** the two acute angles and **circle** the two right angles.



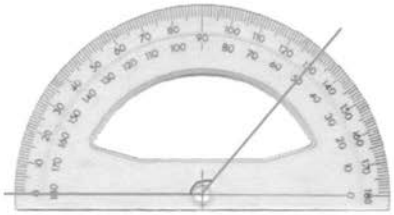
Drawing Angles - Video 28

170. Draw a 40 degree angle.



Measuring Angles - Video 31

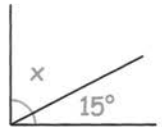
171. Write down the size of the angle being measured.



130 °

Angle Facts - Videos 34, 35, 30, 39

172. Find the size of angle x.



90 - 15

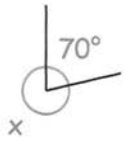
75 °

173. Find the size of angle y.

180 - 63

117 °

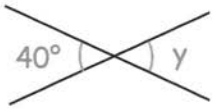
174. Find the size of angle x.



360 − 70 = 290

290 °

175. Find the size of angle y.



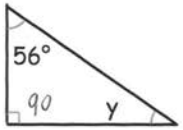
40 °

Angles in a Triangle - Video 37

176. Find the size of angle y.

90 + 56 = 146

180 − 146 = 34



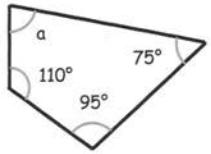
34 °

Angles in a Quadrilateral - Video 33

177. Find the size of angle a.

110 + 75 + 95 = 280

360 − 280 = 80

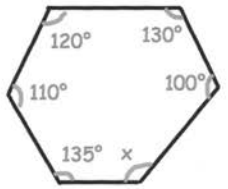


80 °

Angles (polygons) - Video 32

178. Find the size of angle x.

120
130
100
110
+ 135
595



720 − 595 =

125 °

179. Work out the sum of the interior angles for 18 sided polygon.

18 − 2 = 16

16 × 180 = 2880

2880 °

180. The sum of the interior angles in a polygon is 3960°
Work out the number of sides the polygon has.

3960 ÷ 180 = 22

22 + 2 = 24

24 sides

181. Calculate the size of each interior angle in a regular polygon with 40 sides.

38 × 180 = 6840

6840 ÷ 40 = 171°

or

360 ÷ 40 = 9

180 − 9 = 171°

171 °

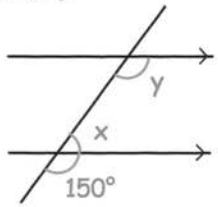
182. Calculate the size of each exterior angle in a regular polygon with 45 sides.

360 ÷ 45 = 8°

8 °

Angles in Parallel Lines - Video 25

183. Find the sizes of angles x and y.



x = 30 ° y = 150 °

Scales - Video 283, 284

184. A map has a scale of 1cm : 10 km
On the map, the distance between two towns is 2.3cm.

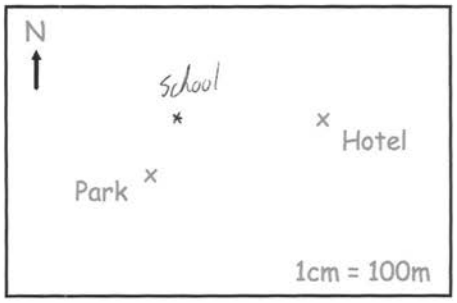
What is the actual distance between the two towns?

2.3 × 10 = 23

23km

Maps - Video 283

185. A school is 300m West of the hotel.
Show this on the map below.



Compass Directions - Video 27b

186. Tom is facing East and turns 90° clockwise.

Which direction is Tom now facing?

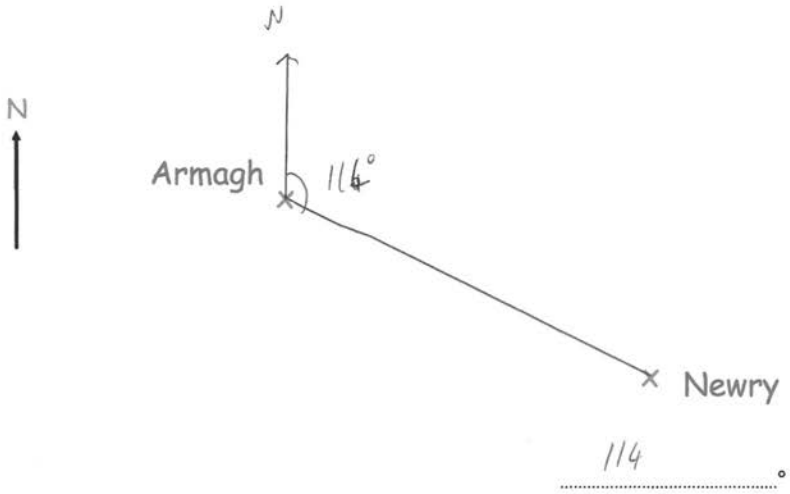
South

187. Town A is North West of Town B.

Town B is South East of Town A.

Bearings - Video 26

188. Write down the three figure bearing of Newry from Armagh



114 °

189. Write down the three figure bearing of Omagh from Cookstown

263 °

Back Bearings - Video 27a

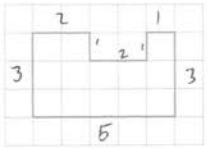
190. The bearing of town A from town B is 140°
What is the bearing of town B from town A?

140 + 180 = 326

320 °

Perimeter on a Grid - Video 242

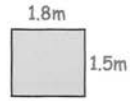
191. The shape below is drawn on a centimetre grid.
Find the perimeter of the shape.



18 cm

Perimeter - Video 241

192. Find the perimeter of this rectangle

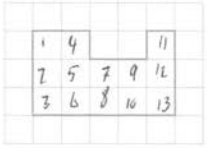


1.8 + 1.5 + 1.8 + 1.5 = 6.6

6.6 m

Area on a Grid - Video 43

193. The shape below is drawn on a centimetre grid.
Find the area of the shape.



13 cm²

Area of a Rectangle - Video 45

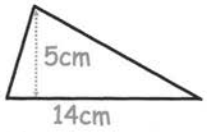
194. Find the area of this rectangle

65 × 9 = 585

585 cm²

Area of a Triangle - Video 49

195. Find the area of this triangle



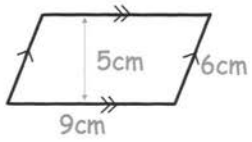
$\frac{1}{2}(14) \times 5$

7×5

35 ..... cm^2

Area of a Parallelogram - Video 44

196. Calculate the area of the parallelogram



$9 \times 5 = 45$

45 ..... cm^2

Area of a Trapezium - Video 48

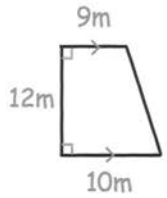
197. Calculate the area of the trapezium

$A = \frac{1}{2}(9 + 10) \times 12$

$= \frac{1}{2}(19) \times 12$

$= 9.5 \times 12$

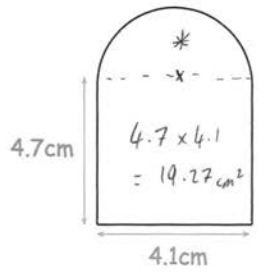
$= 114$



114 ..... m^2

Area of Compound Shapes - Video 41

198. Calculate the area of this compound shape.



$\frac{1}{2} \times \pi \times 2.05^2$

$= 6.60127...$

$19.27 + 6.6012... = 25.8712...$

25.87 to 2dp ..... cm^2

Units - Videos 349a, 349b, 349c

199. Write 4 metres in centimetres

400 ..... cm

200. Write 1900 centimetres in metres

19 ..... m

201. Write 16 centimetres in millimetres

160 ..... mm

202. Write 800 grams in kilograms

0.8 ..... kg

203. Write 1.2 kilograms in grams

1200 ..... g

204. Write 7.1 tonnes in kilograms

7100 kg

205. Write 2.5 litres in millilitres

2500 ml

206. Write 330 millilitres in litres

0.33 L

Sensible Estimates - Video 285

207. Estimate the height of a classroom door.
Circle the suitable answer.

2mm 2cm (2m) 2km

208. Estimate the weight of a field mouse

19kg 1.9 tonnes (19 grams) 1.9kg

Imperial Units - Videos 349a, 349b, 349c

209. Given that 5 miles = 8 kilometres, convert 25 miles in kilometres

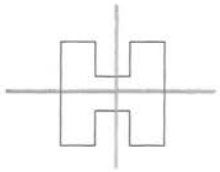
$25 \div 5 = 5$

$5 \times 8 = 40$

40 km

Line Symmetry - Video 316

210. Draw all the lines of symmetry on the shape below.



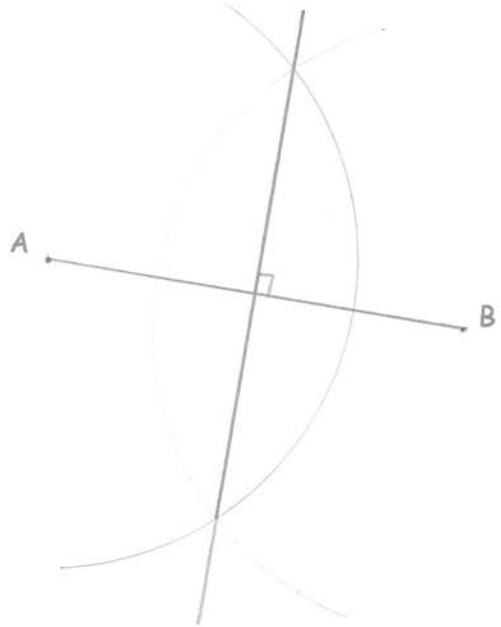
Rotational Symmetry - Video 317

211. Write down the order of rotational symmetry of the sign below.

3

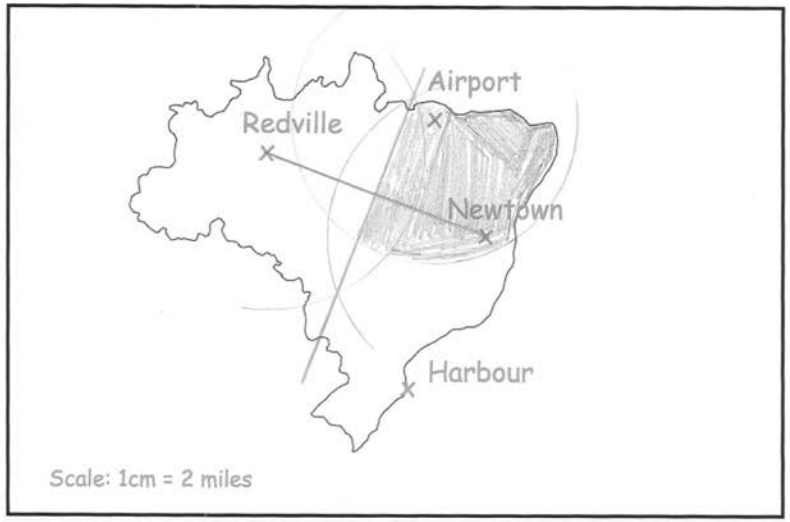
Constructions - Videos 78, 72, 79

212. Use ruler and compasses to construct the perpendicular bisector of AB.
You must show clearly all your construction arcs.



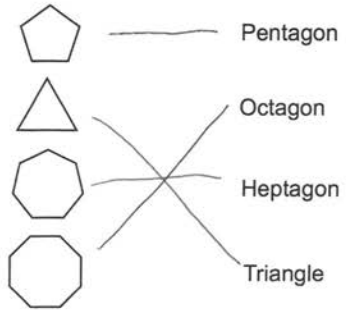
Loci - Videos 75 to 77

213. A farm is closer to Newtown than to Redville.
It is less 6 miles away from the Airport.
3cm
Shade the region on the map where the farm could be.



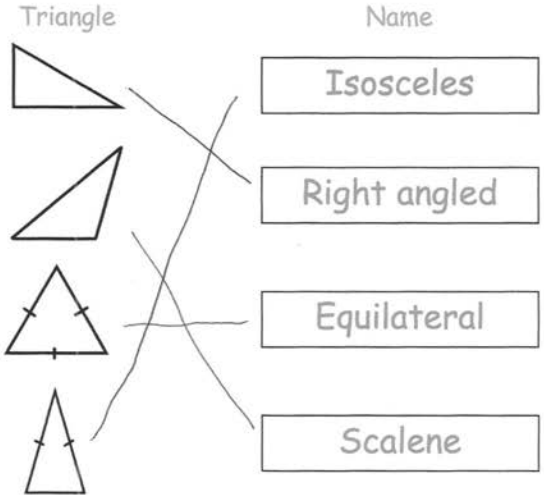
2D Shapes - Video 1

214. Match each shape to the correct name



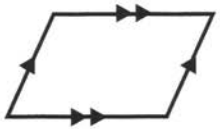
Types of Triangle - Video 327

215. Match each triangle to the correct name



Quadrilaterals - Video 2

216. Here is a quadrilateral.
It has two pairs of parallel sides.

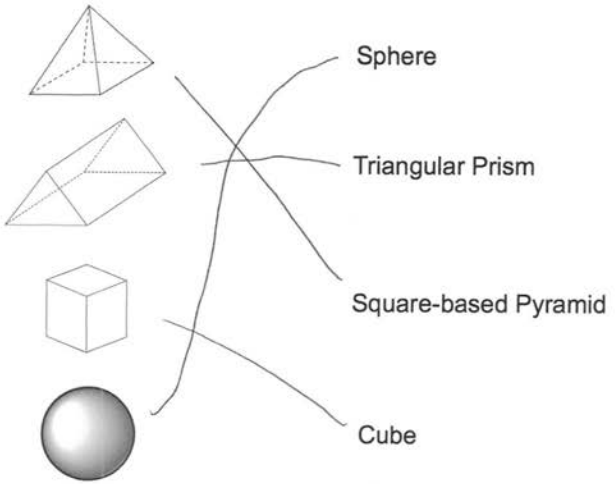


Write down the name of this quadrilateral.

parallelogram

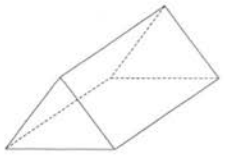
3D Shapes - Video 3

217. Match each shape to the correct name



Edges, Faces, Vertices - Video 5

218. Here is a triangular prism.



How many faces does it have?

5

How many edges does it have?

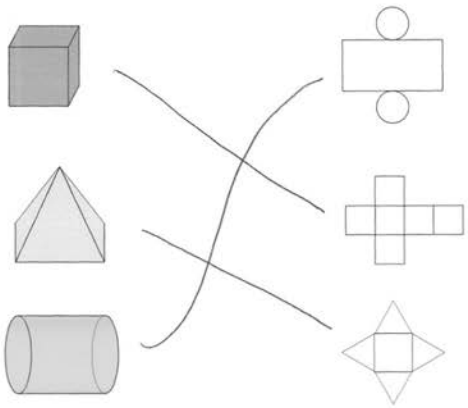
9

How many vertices does it have?

6

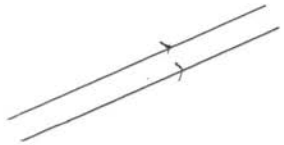
Nets - Video 4

219. Match each 3D shape to the correct net.

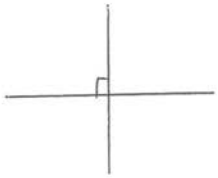


Parallel and Perpendicular Lines - Videos 231, 232

220. Draw a pair of parallel lines.

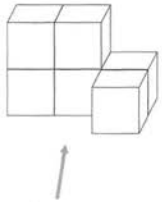


221. Draw a pair of perpendicular lines.

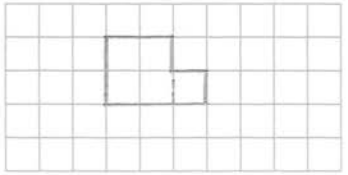


Views and Elevations - Video 354

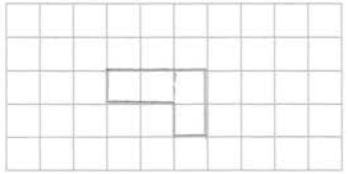
222. Shown below is a solid shape made from 6 centimetre cubes.



On the centimetre square grid, draw the front elevation.



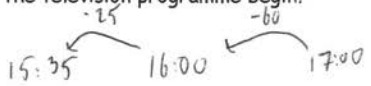
On the centimetre square grid, draw the plan view.



Time Calculations - Video 322

223. A television programme lasted 85 minutes.
The programme finished at 17:00

What time did the television programme begin?



15:35

Timetables - Video 320

Ballymena	15 12	16 12	17 12
Antrim	15 34	-----	17 34
Templepatrick	15 50	-----	17 50
Belfast	16 10	17 00	18 10

224. Dylan arrived in Templepatrick at 17:50
What time did he catch the bus in Antrim?

17:34

225. Orla plans to catch the 16:12 from Ballymena to Belfast.
How long should her journey last?

48 mins

Distance Charts - Video 318

226. The distance chart below shows distances, in miles, between some locations.

Belfast				
56	Coleraine			
38	94	Newry		
23	47	60	Larne	
55	19	94	48	Ballycastle

Isla drives from Belfast to Ballycastle and then to Larne.

How far does Isla drive?

55 + 48 = 103

103 miles

Speed, Distance, Time - Video 299

227. A car travels 300 miles in 5 hours.
Work out the average speed of the car.

300 / 5

60 mph

228. Richard runs at a speed of 8m/s for 25 seconds.
How far does Richard run?

8 x 25 = 200m

200 m

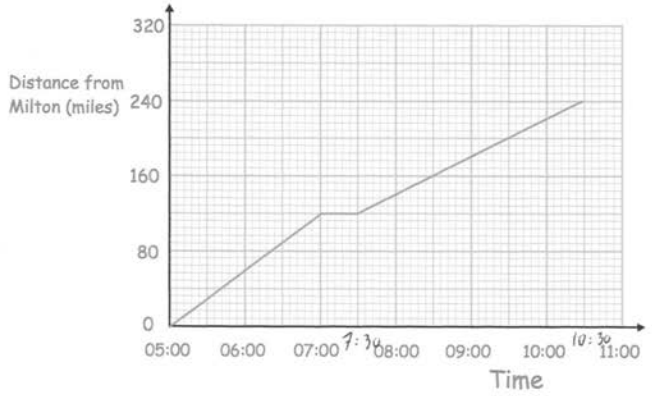
229. Paige drives 90 miles at a speed of 60mph.
How long does the journey take?

$\frac{90}{60} = 1.5$

1.5 hours

Distance-Time Graphs - Video 171

A train travels from Milton to Redville, stops for 30 minutes and then travels to Leek.



230. How far is Redville from Milton?

120 miles

231. How long did it take the train to travel from Redville to Leek?

3 hours

232. Work out the average speed of the train for the journey from Milton to Redville

$\frac{120}{2}$

60 mph

Density - Video 384

233. A piece of aluminium has a mass of 575.4g and a volume of 210cm^3

Calculate the density of the aluminium

$d = \frac{m}{v}$

$= \frac{575.4}{210}$

2.74 g/cm^3

234. A statue has a volume of 120cm^3 and is made from zinc with a density of 7.14g/cm^3

Calculate the mass of the statue

$d = \frac{m}{v}$

$7.14 = \frac{m}{120}$

$7.14 \times 120 = m$

856.8 g

Pressure - Video 385

235. A cube with side length 8cm is placed on a table. $8 \times 8 = 64\,cm^2$
The cube exerts a force of 400N on the table.

Work out the pressure on the table in Newtons/cm^2

$P = \frac{F}{A}$

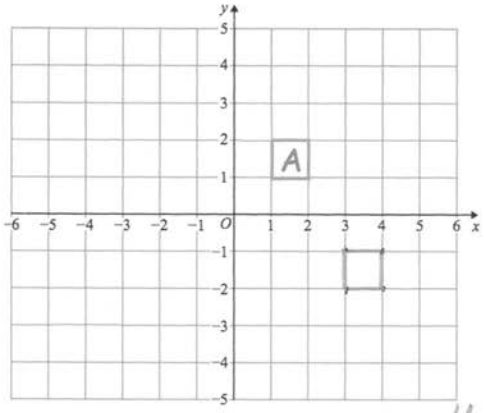
$= \frac{400}{64}$

$= 6.25$

6.25 N/cm^2

Translations - Video 325

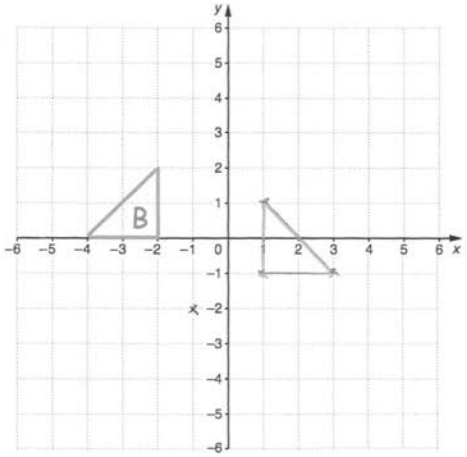
236.



Translate A by $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$ right down

Rotations - Video 275

237.

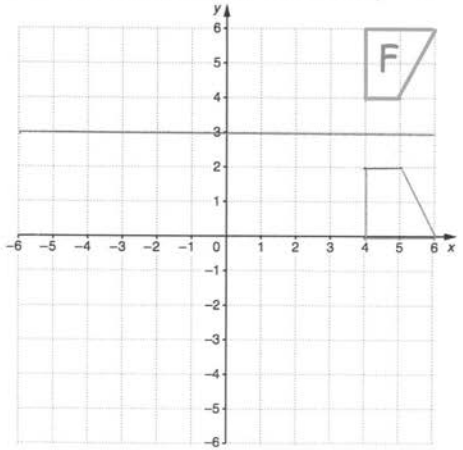


rotate 90° clockwise about (-1, -2)

Reflections - Video 272

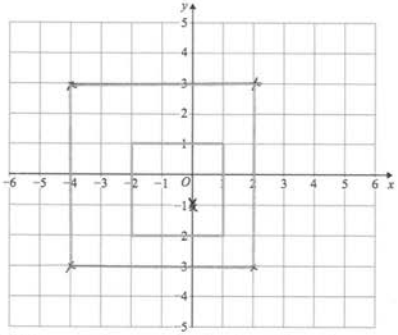
238.

Reflect shape F in the line y = 3



Enlargements - Videos 104, 104a

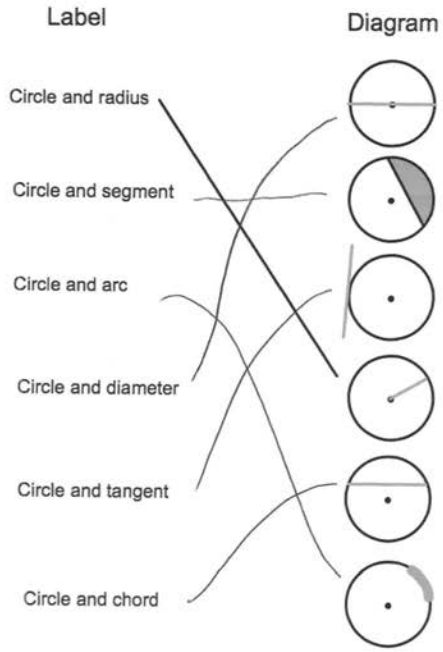
239.



Enlarge by scale factor 2 using (0, -1) as the centre of enlargement

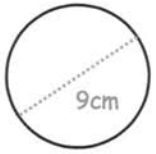
Parts of a Circle - Video 61

240.



Circumference - Video 60

241. Calculate the circumference of this circle.
Give your answer to 1 decimal place.



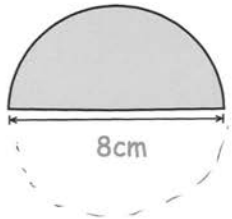
π × 9 = 28.2743...

28.3

.....cm

Perimeter of a Semi-Circle - Video 243

242. Calculate the perimeter of this semi-circle



π × 8 = 25.1327...

25.1327... ÷ 2 = 12.566...

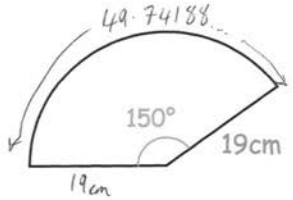
12.566... + 8 = 20.566...

20.57

.....cm

Arc Length - Video 58

243. Find the perimeter of this sector.
Give your answer to 1 decimal place.



$\frac{150}{360}$ × π × 38 = 49.74188...

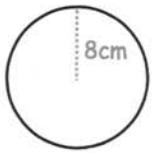
19 + 19 + 49.7418... = 87.741...

87.7

.....cm

Area of a Circle - Video 59

244. Calculate the area of this circle.
Give your answer to 1 decimal place.



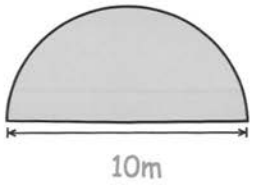
$\pi \times 8^2$

$= 201.0619...$

201.1 ..... cm^2

Area of a Semi-Circle - Video 47

245. Calculate the area of this semi-circle



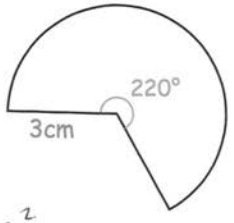
$\frac{1}{2} \times \pi \times 5^2$

$= 39.27 \text{ m}^2$

39.27 ..... m^2

Area of a Sector - Video 46

246. Find the area of this sector.
Give your answer to 1 decimal place.



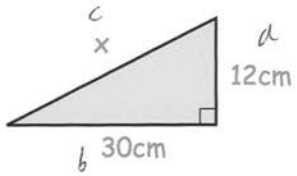
$\frac{220}{360} \times \pi \times 3^2$

$= 17.2787...$

17.3 ..... cm^2

Pythagoras - Video 257

247. Find x.
Give your answer to 2 decimal places.



$12^2 + 30^2 = x^2$

$144 + 900 = x^2$

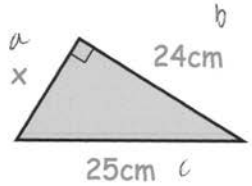
$1044 = x^2$

$x = \sqrt{1044}$

32.31 ..... cm

248. Find x.

Give your answer to 2 decimal places.



$x^2 + 24^2 = 25^2$

$x^2 + 576 = 625$

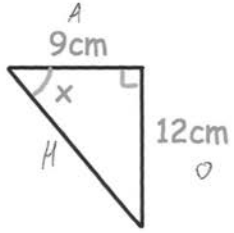
$x^2 = 49$

$x = 7$

7 ..... cm

Trigonometry - Videos 329, 330, 331

249. Find x



$T = \frac{O}{A}$ $S = \frac{O}{H}$ $C = \frac{A}{H}$

$\tan x = \frac{12}{9}$

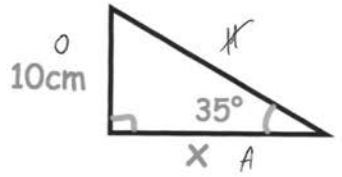
$x = \tan^{-1}\left(\frac{12}{9}\right)$

$x = 53.13^\circ$

53.13 .....°

250. Find x

$T = \frac{O}{A}$ $S = \frac{O}{H}$ $C = \frac{A}{H}$



$\tan 35 = \frac{10}{x}$

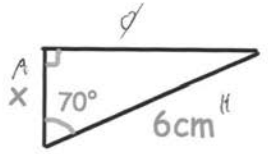
$x \tan 35 = 10$

$x = \frac{10}{\tan 35}$

$= 14.281...$ cm

14.28 ..... cm

251. Find x



$T = \frac{A}{H}$ $S = \frac{O}{H}$ $C = \frac{A}{H}$

$\cos 70 = \frac{x}{6}$

$6 \times \cos 70 = x$

$x = 2.052...$

2.052 ..... cm

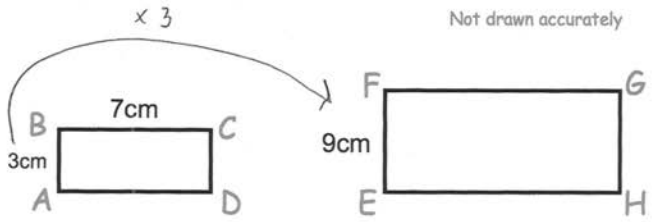
Exact Trig Values - Videos 329, 330, 331

252. Write down the value of cos90°

0 .....

Similar Shapes - Video 292

253. Shown below are two mathematically similar rectangles



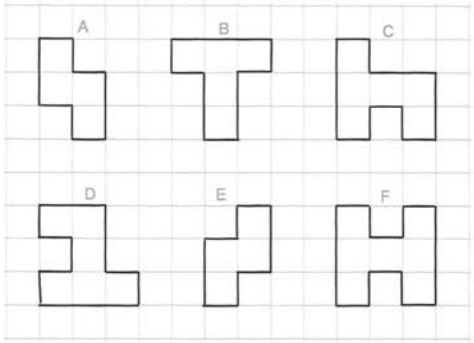
7 x 3 = 21

. Find the length of FG

21 cm

Congruent Shapes - Video 66

254.

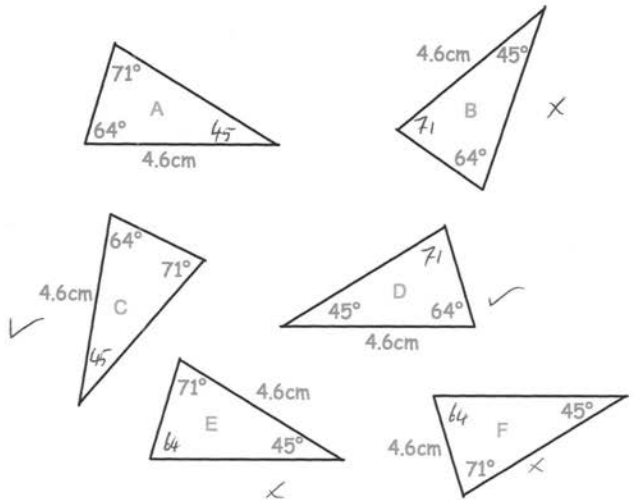


Which shape is congruent to shape E?

A

Congruent Triangles - Video 67

255. Shown below are six triangles that are not drawn accurately.

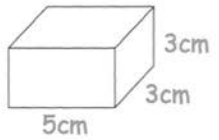


Which two triangles are congruent to triangle A?

C and D

Volume of a Cuboid - Video 355

256. Work out the volume of this cuboid.



V = 5 x 3 x 3

= 45

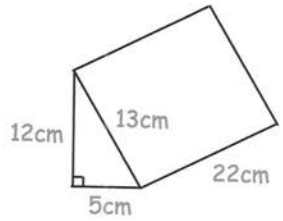
45 cm³

Volume of a Prism - Video 356

257. Calculate the volume of the triangular prism.

$\frac{1}{2}(5 \times 12) = \frac{1}{2}(60) = 30$

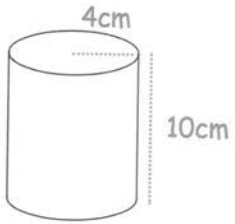
$V = 30 \times 22$



660 cm³

Volume of a Cylinder - Video 357

258. Calculate the volume of the cylinder.



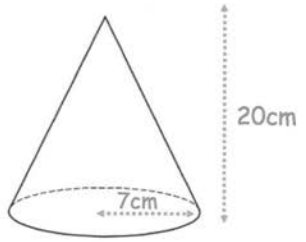
$V = \pi \times 4^2 \times 10$

$= 502.65...$

502.655 cm³

Volume of a Cone - Video 359

259. Calculate the volume of the cone.
Give your answer to 1 decimal place.



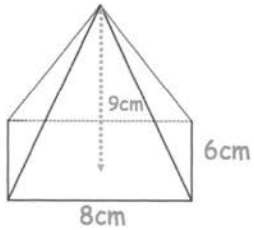
$V = \frac{1}{3} \times \pi \times 7^2 \times 20$

$= 1026.2536...$

1026.3 cm³

Volume of a Cone - Video 359

260. A rectangular-based pyramid is shown below.



Calculate the volume of the pyramid.

$V = \frac{1}{3} \times (6 \times 8) \times 9$

$= 144$

144 cm³

Volume of a Sphere - Video 361

261. Calculate the volume of the sphere.
Give your answer to 1 decimal place.

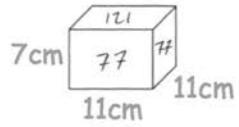
$\frac{4}{3} \times \pi \times 4^3$

$= 268.0825..$

268.1 ..... cm^3

Surface Area - Video 310

262. Work out the surface area of this cuboid.



$121 + 77 + 77 + 121 + 77 + 77 = 550$

550 ..... cm^2

Surface Area of a Sphere - Video 313

263. Calculate the surface area of the sphere.
Give your answer to 1 decimal place.

$SA = 4 \times \pi \times r^2$

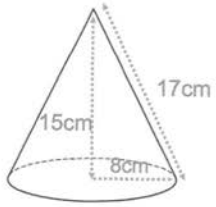
$= 4 \times \pi \times 3^2$

$= 113.097..$

113.1 ..... cm^2

Surface Area of a Cone - Video 314

264. Calculate the surface area of the cone.
Give your answer to 1 decimal place.



$\pi \times 8^2 = 201.0619..$

$\pi \times 8 \times 17 = 427.2566..$

$628.318..$

628.3 ..... cm^2

Converting Units for Area/Volume - Videos 350, 351

265. Write $7m^2$ in cm^2

$7 \times 100 \times 100$

70000 cm^2

266. Write $19000000cm^3$ in m^3

$19000000 \div 1000000$

19 m^3

Column Vectors - Video 353a

267. $\mathbf{a} = \begin{pmatrix} 2 \\ 0 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} 1 \\ 5 \end{pmatrix}$

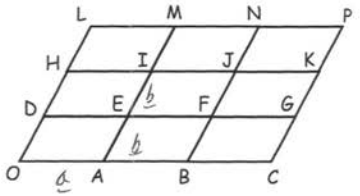
Work out $4\mathbf{a} + 2\mathbf{b}$

$4\underline{a} = \begin{pmatrix} 8 \\ 0 \end{pmatrix}$ $2\underline{b} = \begin{pmatrix} 2 \\ 10 \end{pmatrix}$

$\begin{pmatrix} 10 \\ 10 \end{pmatrix}$

Vectors - Video 353

268.



$\overrightarrow{OA} = \mathbf{a}$ $\overrightarrow{OD} = \mathbf{b}$

Write $\overrightarrow{OI}$ in terms of **a** and **b**

$\underline{a} + 2\underline{b}$

Writing Expressions - Video 16

Carl is x years old.
Darragh is three times older than Carl.
Emma is four years younger than Darragh.
Fiona is half Carl's age.

269. Write an expression for Darragh's age.

$3x$

270. Write an expression for Emma's age.

$3x - 4$

271. Write an expression for Fiona's age.

$\frac{x}{2}$

Collecting Like Terms - Video 9

272. Simplify $a + a + a + a - a$

$3a$

273. Simplify $6x + y - 5x - 5y$

$x - 4y$

Multiplying Terms - Video 18

274. Simplify $6 \times w$

$6w$

275. Simplify $7 \times 3y$

$21y$

Laws of Indices - Video 174

276. Simplify $w^8 \times w^4$

w^{12}

277. Simplify $w^{10} \div w^4$

w^6

278. Simplify $(w^4)^3$

w^{12}

Expanding Brackets - Video 13

279. Expand $4(2w - 3)$

$8w - 12$

280. Multiply out and simplify $2(x + 3) + 4(x - 1)$

$2x + 6 + 4x - 4$

$6x + 2$

$6x + 2$

281. Expand $y(2y - 3)$

$2y^2 - 3y$

Expanding 2 Brackets - Video 14

282. Expand and simplify $(x + 5)(x + 6)$

	x	$+5$
x	x^2	$+5x$
$+6$	$+6x$	$+30$

$x^2 + 6x + 5x + 30$

$x^2 + 11x + 30$

$x^2 + 11x + 30$

283. Expand and simplify $(x - 8)(x + 6)$

	x	-8
x	x^2	$-8x$
$+6$	$+6x$	-48

$x^2 + 6x - 8x - 48$

$x^2 - 2x - 48$

$x^2 - 2x - 48$

284. Expand and simplify $(x-12)(x-3)$

	x	-12
x	x^2	$-12x$
-3	$-3x$	$+36$

$x^2 - 3x - 12x + 36$

$x^2 - 15x + 36$

$x^2 - 15x + 36$

285. Expand and simplify $(5x+4)(x-2)$

	$5x$	$+4$
x	$5x^2$	$+4x$
-2	$-10x$	-8

$5x^2 - 10x + 4x - 8$

$5x^2 - 6x - 8$

$5x^2 - 6x - 8$

Factorising - Video 117

286. Factorise $6x + 8$

$2(3x+4)$

$2(3x+4)$

287. Factorise $15y - 20$

$5(3y-4)$

288. Factorise $4x^3 + 5x$

$x(4x^2+5)$

Factorising Quadratics - Video 118

289. Factorise $x^2 + 6x + 9$

$(x+3)(x+3)$

290. Factorise $x^2 + 12x + 20$

$(x+10)(x+2)$

291. Factorise $x^2 + 3x - 10$

$(x+5)(x-2)$

292. Factorise $x^2 - 6x - 55$

$(x+5)(x-11)$

293. Factorise $x^2 - 12x + 32$

$(x-4)(x-8)$

Solving Quadratics - Video 266

294. Solve $x^2 + 7x + 10 = 0$

$(x+2)(x+5) = 0$

$x = -2$ or $x = -5$

$x = -2$ or $x = -5$

295. Solve $x^2 - 2x - 8 = 0$

$(x-4)(x+2) = 0$

$x = 4$ or $x = -2$

$x = 4$ or $x = -2$

Difference between 2 Squares - Video 120

296. Factorise $x^2 - 4$

$(x-2)(x+2)$

297. Factorise $81 - x^2$

$(9-x)(9+x)$

Substitution - Video 20

298. Given that w = 3 and y = 9

find the value of 7w - 2y

$21 - 18$

3

299. x is an odd number
y is an even number

State if the following are odd or even

x + y

e.g. $5 + 8 = 13$

odd

xy

$5 \times 8 = 40$

even

Solving Equations - Video 110

300. Solve y + 11 = 15

$-11 \quad -11$

$y = 4$

y = 4

301. Solve $\frac{c}{4} = 8$

×4 ×4

$c = 32$

c = 32

302. Solve $6x = 72$

÷6 ÷6

$x = 12$

x = 12

303. Solve $w - 2 = 7$

+2 +2

$w = 9$

w = 9

304. Solve $7y - 4 = 38$

+4 +4

$7y = 42$

÷7 ÷7

$y = 6$

y = 6

305. Solve $8 + 10y = 58$

-8 -8

$10y = 50$

÷10 ÷10

$y = 5$

y = 5

Letters Both Sides - Video 113

306. Solve $7x + 2 = 4x + 29$

-4x -4x

$3x + 2 = 29$

-2 -2

$3x = 27$

÷3 ÷3

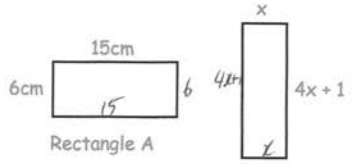
$x = 9$

x = 9

Forming Equations - Videos 114, 115

307. Both rectangles have the same perimeter.

Find the value of x.



$10x + 2$

$15 + 15 + 6 + 6 = 42$

$10x + 2 = 42$

-2 -2

$10x = 40$

$x = 4$

4

Solving Inequalities - Video 178

308. Solve $4x < 32$

$\div 4 \quad \div 4$

$x < 8$

$x < 8$

309. Solve $5x + 1 > 91$

$-1 \quad -1$

$5x > 90$

$\div 5 \quad \div 5$

$x > 18$

$x > 18$

310. Solve $7x - 5 \leq 3x + 11$

$4x - 5 \leq 11$

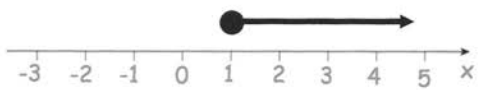
$4x \leq 16$

$x \leq 4$

$x \leq 4$

Inequalities (number line) - Video 177

311.



Write down the inequality shown above.

$x \geq 1$

312. Solve the inequality $2x - 1 < 5$ and represent the answer on the number line below.

$2x < 6$

$x < 3$

313. List all the integers that satisfy the inequality $4 < 3n < 15$

$1.333.. < n < 5$

2, 3, 4

Changing the Subject - Video 7

314. Make y the subject of $w = y - a$

$+a \quad +a$

$w + a = y$

y = $w + a$

315. Make x the subject of $m = 2x - y$

$+y \quad +y$

$m + y = 2x$

$\div 2 \quad \div 2$

$\frac{m+y}{2} = x$

x = $\frac{m+y}{2}$

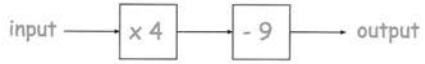
Equations/Identities - Video 367a

316. Circle the identity

$4x + 9$ $5x < 4$ $x + x \equiv 2x$ $8x - 3 = 77$

Function Machines - Video 386

317. Below is a number machine.



(a) Work out the output when the input is 6

$6 \times 4 = 24$

$24 - 9 = 15$

15

(b) Work out the input when the output is 35

$35 + 9 = 44$

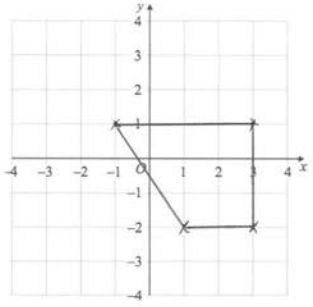
$44 \div 4 = 11$

11

Coordinates - Video 84

318. The vertices of a quadrilateral have these coordinates.

(3, -2) (1, -2) (3, 1) (-1, 1)



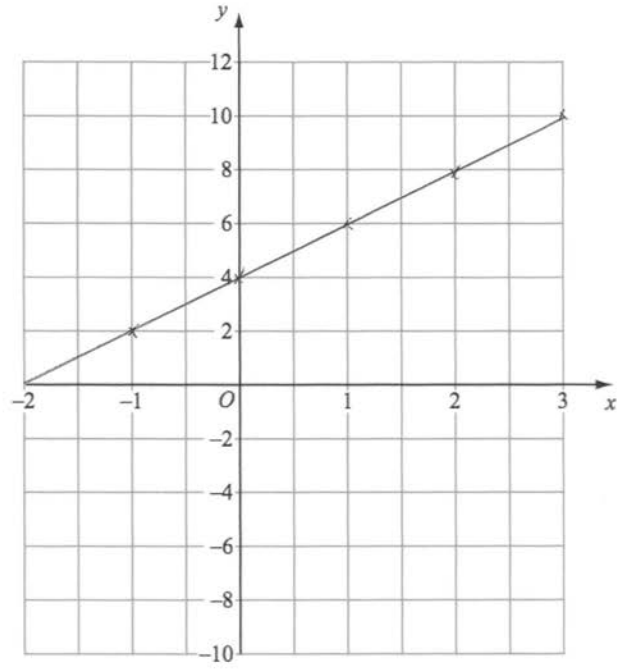
Complete the quadrilateral

Drawing Linear Graphs - Video 186

319. (a) Complete the table of values for $y = 2x + 4$.

x	-1	0	1	2	3
y	2	4	6	8	10

(b) On the grid, draw the graph of $y = 2x + 4$ for values of x from –1 to 3.



Midpoint of a Line - Video 198

320. A(3, -2) and B(7, 10)

Find the coordinates of the midpoint of AB

$3 + 7 = 10$

$10 \div 2 = 5$

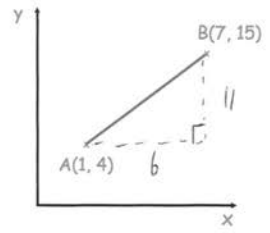
$-2 + 10 = 8$

$8 \div 2 = 4$

(5, 4)

Length of a Line - Video 263

321. Shown below are the points A(1, 4) and B(7, 15)



Calculate the length of the line joining A and B.

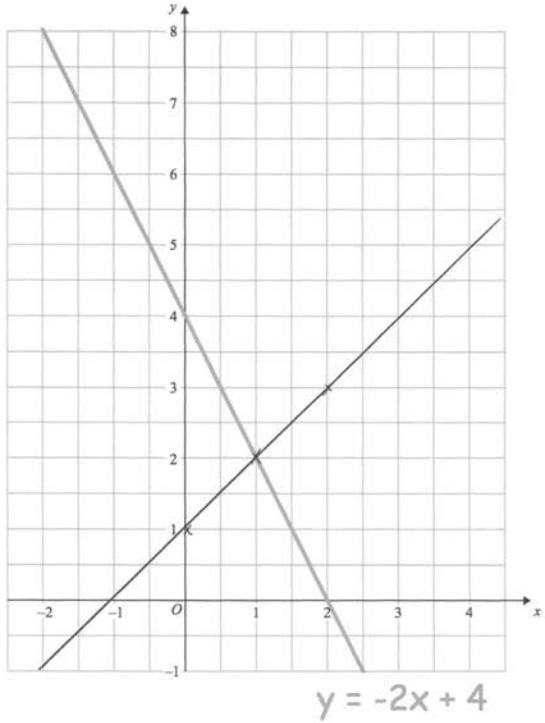
$6^2 + 11^2 = 157$

$\sqrt{157} = 12.52996\ldots$

12.53

Graphical Solutions - Video 297

322. The straight line $y = -2x + 4$ has been drawn on the grid.



By drawing a suitable line, solve the simultaneous equations

$y = -2x + 4$

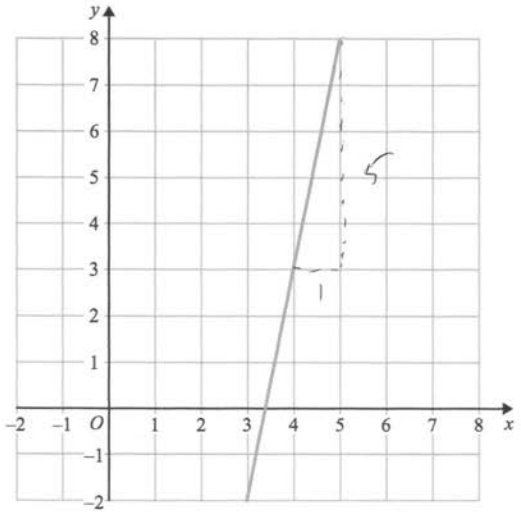
$y = x + 1$

x	0	1	2
y	1	2	3

x = 1 y = 2

Gradient - Video 189

323. Find the gradient of the line below



$\frac{\text{rise}}{\text{run}} = \frac{5}{1} = 5$

5

Equation of a Line - Videos 186 to 195

324. A straight line has equation $y = 5x - 2$

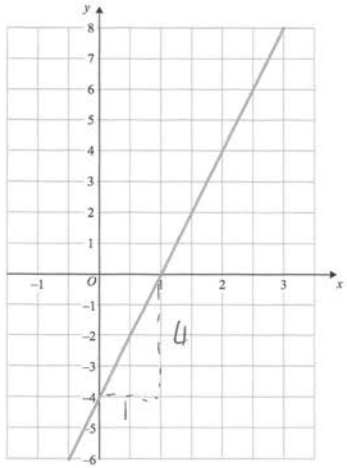
(a) What is the gradient of the line?

5

(b) Write down the coordinates of the y-intercept

(0, -2)

325. Find the equation of the line below



$m = \frac{4}{1} = 4$

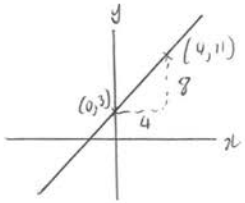
$y = 4x - 4$

326. A straight line has a gradient of −2 and passes through the point (1, 10).

Write down the equation of the line.

$y = -2x + 12$

327. Find the equation of the straight line that passes through the points (0, 3) and (4, 11)



$m = \frac{8}{4} = 2$

$y = 2x + 3$

$y = 2x + 3$

328. Find the equation of the straight line that passes through the points (−8, −10) and (0, 14)

$m = \frac{24}{8} = 3$

$y = 3x + 14$

Parallel Lines - Video 196

329. Write down an equation of a line parallel to $y = 6x + 5$

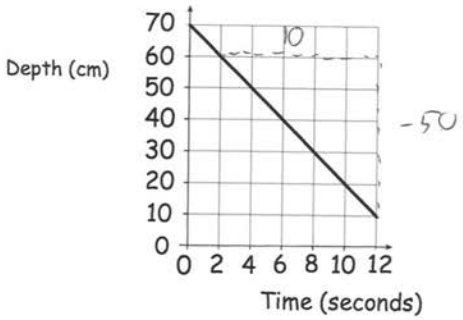
$y = 6x + 1$

330. Write down the equation of the line parallel to $y = 3x + 1$ that passes through the point (0, 2)

$y = 3x + 2$

Real Life Graphs - Video 171a

331. The graph below shows the depth of water in a container.



Calculate the gradient of the line $\frac{-50}{10} = -5$

-5

What does the gradient of the line represent?

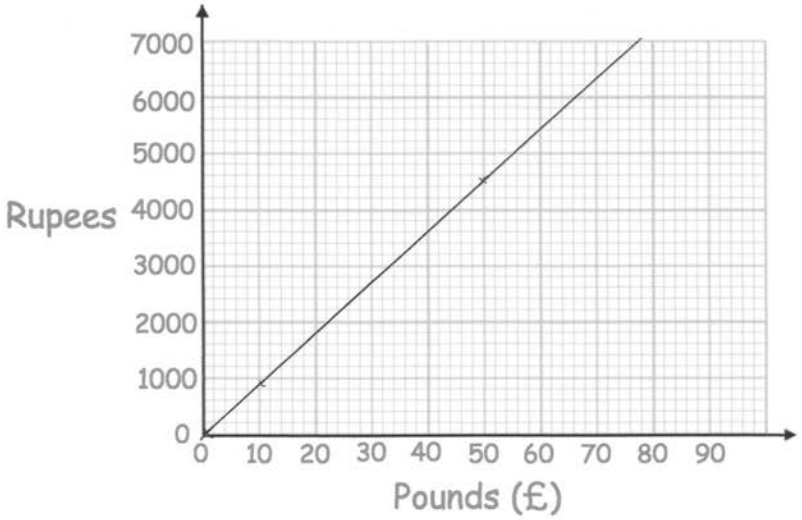
The change in depth of the water every second, -5 cm. The height/depth decreases by 5 cm every second.

Conversion Graphs - Videos 151, 152

332. Complete the table below

Pounds	0	1	10	50
Rupees	0	90	900	4500

Draw a conversion graph for converting between pounds and rupees.

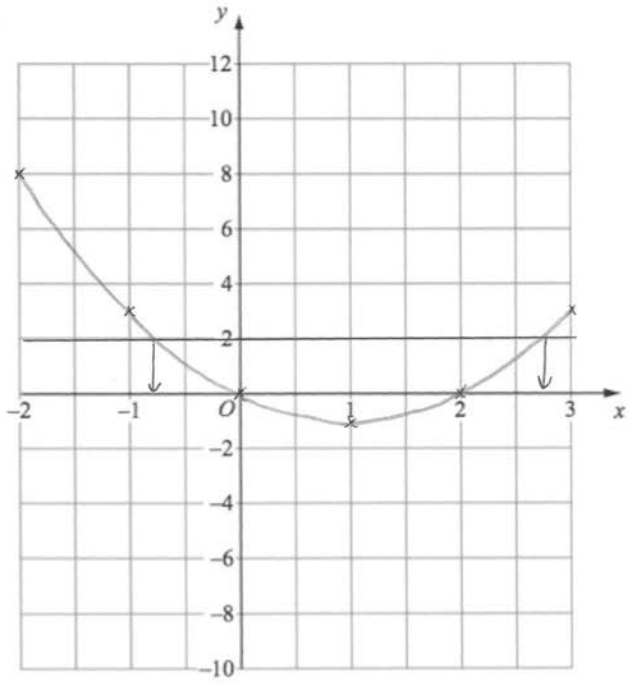


Quadratic Graphs - Video 264

333. Complete the table of values for $y = x^2 - 2x$

x	-2	-1	0	1	2	3
y	8	3	0	-1	0	3

334. Draw the graph of $y = x^2 - 2x$



Solving Quadratics Graphically - Video 267c

335. Use the graph from Question 323 to estimate the values of x when y = 2

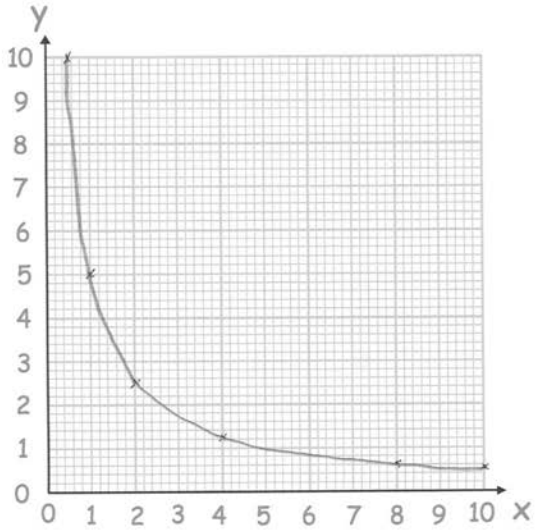
x = ... and x = ...

Reciprocal Graphs - Video 346

336. Complete the table of values for $y = \frac{5}{x}$

x	0.5	1	2	4	8	10
y	10	5	2.5	1.25	0.625	0.5

337. On the grid, draw the graph of $y = \frac{5}{x}$ for $0.5 \leq x \leq 10$

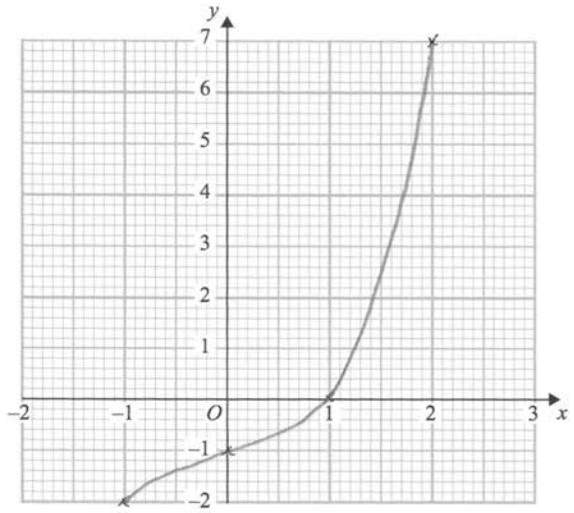


Cubic Graphs - Video 344

338. Complete the table of values for $y = x^3 - 1$

x	-2	-1	0	1	2
y	-9	-2	-1	0	7

339. On the grid, draw the graph of $y = x^3 - 1$ for $-1 \leq x \leq 2$



Sequences - Videos 286, 287

340. Find the next two terms in the sequence 19, 23, 27, 31, ... , ...

35 and 39

341. Find the next two terms in the sequence 4, 9, 16, 25, ... , ...

36 and 49

342. Find the next two terms in the sequence 1, 8, 27, 64, ... , ...

125 and 216

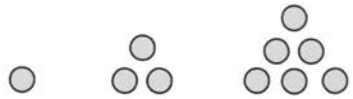
343. Find the next two terms in the sequence 1, 3, 6, 10, ... , ...

+2 +3 +4

15 and 21

Triangular Numbers - Video 229

344. List the first 6 triangular numbers



1 3 6 10 15 21

Generating Sequences - Video 290a

345. Ciara forms a sequence by using the rule:

"Find the next term by adding the previous two terms."

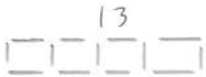
The first three terms of Ciara's sequence are 2, 5 and 7.
Find the next two terms of Ciara's sequence.

12 and 19

Patterns - Video 290

These patterns are made of sticks.

346. Draw Pattern 4



347. How many sticks will there be in Pattern 6?

16 19

19

Fibonacci - Video 287a

348. Here are the first five terms of a Fibonacci sequence.

2 5 7 12 19

Write down the next two terms of the sequence.

31 and 50

nth Term - Video 288

349. Find the nth term of 9, 20, 31, 42 ... ...

11n 11 22 33 44

11n - 2

350. Find the nth term of 50, 48, 46, 44 ... ...

-2n -2 -4 -6 -8

-2n + 52

351. Find the nth term and the 100th term of 7, 10, 13, 16 ... ...

3n+4 3 6 9 12

nth term = 3n + 4

100th term = 304

Arithmetic/Geometric Progressions - Video 375

352. Circle the geometric progression.

11, 9, 7, 5 ... 1, 4, 9, 16 ... 11, 21, 31, 41 ... (1, 4, 16, 64 ...)

Simultaneous Equations - Video 295

353. Solve the simultaneous equations

$2x + 4y = 26$ — (1)
$3x - y = 4$ — (2) × 4

$2x + 4y = 26$
$12x - 4y = 16$
$14x = 42$
$x = 3$

sub $x = 3$ into (1)
$6 + 4y = 26$
$4y = 20$
$y = 5$

check in (2)
$9 - 5 = 4$ ✓

x = 3 y = 5

354. Solve the simultaneous equations

$3x + 2y = 16$ — (1) × 3
$2x - 3y = 2$ — (2) × 2

$9x + 6y = 48$
$4x - 6y = 4$
$13x = 52$
$x = 4$

sub $x = 4$ into (1)
$12 + 2y = 16$
$2y = 4$
$y = 2$

check in (2)
$8 - 6 = 2$ ✓

x = 4 y = 2

355. Three bananas and two pears cost 95p.
Five bananas and three pears cost £1.51

Find the cost of ten bananas and ten pears.

$3x + 2y = 95$ — (1) × 3
$5x + 3y = 151$ — (2) × 2

$9x + 6y = 285$
$10x + 6y = 302$
sub $9x + 6y = 285$
$x = 17$ sub into (1)

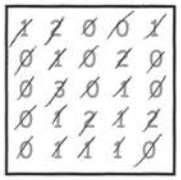
$51 + 2y = 95$
$2y = 44$
$y = 22$

$10x + 10y$
$170 + 220 = 390$

£3.90

Tally Charts - Video 321

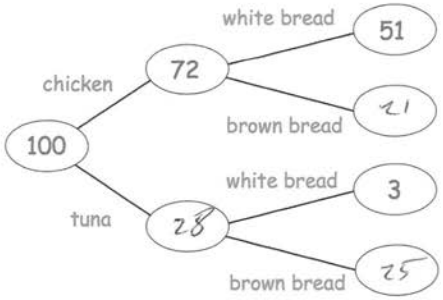
356. Dara has recorded how many tries he scored in 25 rugby matches
Complete the tally chart



Number of tries	Tally	Frequency
0	𝍸 𝍸 |	11
1	𝍸 1111	9
2	1111	4
3	|	1

Frequency Trees - Video 376

357. Complete the frequency tree.



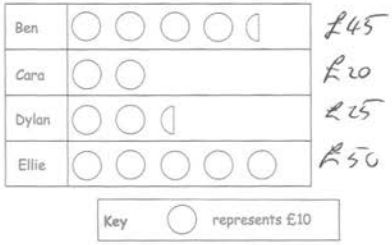
Two-way Tables - Video 319

358. Complete the two-way table.

	T-shirts	Jumpers	Coats	Total
Small	2	36	28	66
Medium	9	0	1	10
Large	58	51	15	124
Total	69	87	44	200

Pictograms - Videos 161, 162

359. The pictogram shows information about the amounts of money raised for charity by 4 friends.



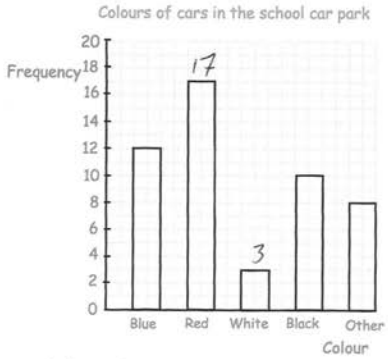
How much money was raised in total?

45 + 20 + 25 + 50 = £140

£ 140

Bar Charts - Videos 147, 148, 148b

360.

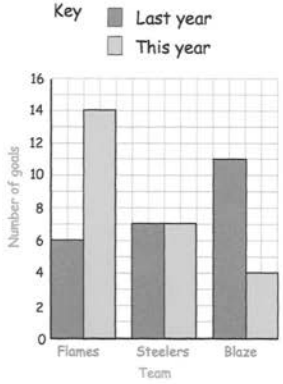


How many more red than white cars were in the car park?

17 - 3 = 14

14

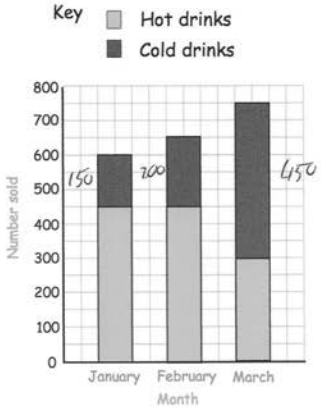
Dual Bar Charts - Video 148b



361. Which team scored the same number of goals in the cup this year and last year?

Steelers

Composite Bar Charts - Video 148b



362. How many cold drinks were sold in total over 3 months?

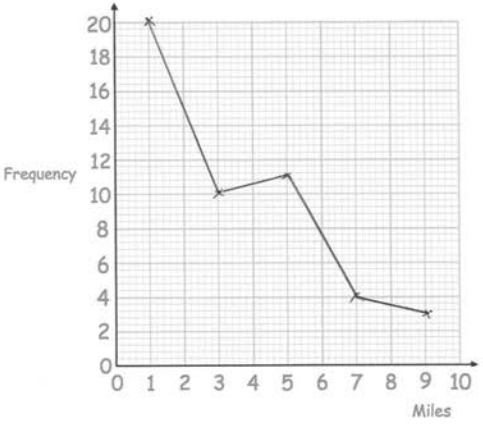
150 + 200 + 450 = 800

800

Frequency Polygons - Videos 155, 156

363. Draw a frequency polygon to represent the data in the table.

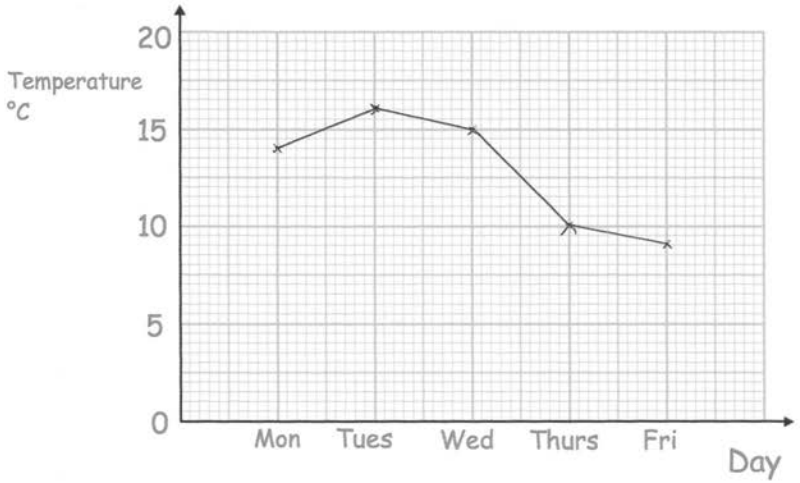
Distance (miles)	Frequency
$0 < d \leq 2$	20
$2 < d \leq 4$	10
$4 < d \leq 6$	11
$6 < d \leq 8$	4
$8 < d \leq 10$	3



Line Graphs - Video 160

364. Complete the line graph.

	Belfast
Monday	14°C
Tuesday	16°C
Wednesday	15°C
Thursday	10°C
Friday	9°C

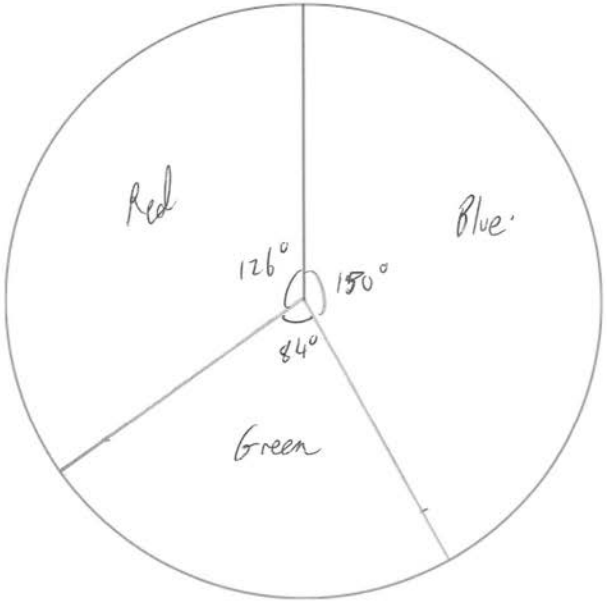


Pie Charts - Videos 163, 164

365. Sixty beads are placed in a box.
Draw a pie chart to represent the colours of the beads in the box.

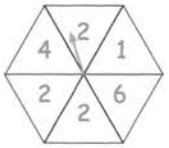
$360 \div 60 = 6°$

Colour	Frequency	
Blue	25	$\times 6 = 150°$
Green	14	$\times 6 = 84°$
Red	21	$\times 6 = 126°$
	60	



Probability Scale - Video 251

366. A fair spinner has 6 equal sections.



Impossible	Unlikely	Even	Likely	Certain

Which word from the box best describes the likelihood of each of the following

The arrow landing on an even number

Likely

The arrow landing on 4

Unlikely

The arrow landing on the number 2

Even

Probability - Video 245

20

367. There are 12 red roses, 5 yellow roses and 3 white roses in a vase.
Felix takes a rose, at random, from the vase.

Write down the probability that he takes a white rose

3/20

Write down the probability that he takes a red **or** white rose

15/20

3/4 or 15/20

Not Happening - Video 250

368. On a day in December, the probability of it snowing is 0.3

What is the probability of it **not** snowing?

0.7

Relative Frequency - Video 248

David and Becky want to estimate how many yellow jelly beans are in a tub.

A trial consists of taking a jelly bean at random, noting the colour, and replacing the jelly bean in the tub.

	Number of trials	Number of yellow jelly beans chosen
David	20	3
Becky	100	11

369. Write down the relative frequency of David taking a yellow jelly bean.

3/20

370. Write down the relative frequency of Becky taking a yellow jelly bean.

11/100

371. Whose experiment gives the more reliable results?
Give a reason for your answer.

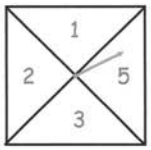
Becky - more trials.

Listing Outcomes - Video 253

372. A fair spinner has four sections.
The spinner is spun twice.
The two numbers are added together to get a final score.

List all the possible final scores.

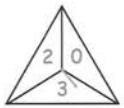
5 2 1 = 6 3 2 1 = 4
5 2 2 = 7 3 2 2 = 5
5 2 3 = 8 3 2 3 = 6
5 2 5 = 10 3 2 5 = 8
1 2 5 = 6 2 2 1 = 3
1 2 3 = 4 2 2 3 = 5
1 2 2 = 3 2 2 2 = 4
1 2 1 = 2 2 2 5 = 7



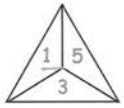
2, 3, 4, 5, 6, 7, 8, 10

Sample Spaces - Video 246

Emily uses two fair spinners in a game.
She spins both spinners and she multiplies the two numbers together.



Spinner 1



Spinner 2

Spinner 2 \ Spinner 1 ×	0	2	3
1	0	2	3
3	0	6	9
5	0	10	15

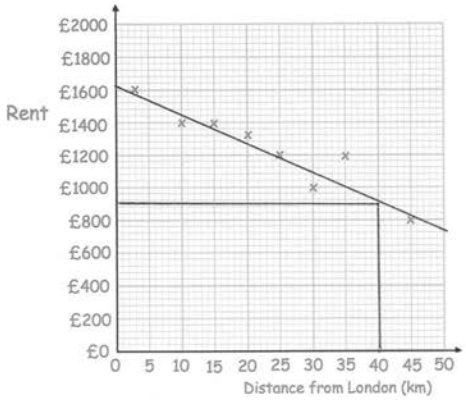
373. Complete the table to show all possible outcomes.

374. Find the probability that her answer is greater than 5.

4/9

Scatter Graphs - Videos 165 to 168

375. The scatter graph shows information about the cost of renting apartments and their distance from London.



What type of correlation is shown?

Negative

Estimate the cost of renting an apartment 40km from London.

£ 900

Stem-and-Leaf - Videos 169, 170

376. The stem and leaf diagram shows the heights of 14 friends visiting a theme park

Key: 13|5 means 135cm

13	5 7 8
14	1 1 2 6 7 9
15	0 2 7
16	1 8

What fraction of the friends have a height greater than 1.4m?

11/14

Mode - Video 56

377. Write down the mode

5 9 3 4 5 1 9 5 8 7

5

Median - Video 50

378. Find the median

12 7 11 14 15 19

~~7~~ ~~11~~ 12 14 ~~15~~ ~~19~~

13

Mean - Video 53

379. Work out the mean

9 + 8 + 15 + 24 = 56

56 ÷ 4

14

Ranges - Video 57

380. Work out the range

9 8 15 24

24 − 8 =

16

Mode from a Frequency Table - Video 56a

381. The table shows the number of apples eaten one day by 40 people.

Number of apples	Frequency
0	11
1	14
2	8
3	7

Write down the modal number of apples eaten.

1

Mean from a Frequency Table - Video 54

382. The table shows the number of apples eaten one day by 10 people.

Number of apples	Frequency	f x
0	2	0
1	2	2
2	5	10
3	1	3
		15

Work out the mean number of apples eaten.

15 ÷ 10 = 1.5

1.5

Median from a Frequency Table - Video 51

383. The table shows the number of apples eaten one day by 9 people.

Number of apples	Frequency
0	3
1	4
2	1
3	1

Work out the median number of apples eaten.

0 0 0 1 1 2 2 3

1

Estimated Mean - Video 55

384. Work out an estimate for the mean length.

Length (cm)		Frequency	fx
0 ≤ L < 30	15	8	120
30 ≤ L < 60	45	43	1935
60 ≤ L < 90	75	25	1875
90 ≤ L < 120	105	4	420
		80	4350

4350 ÷ 80 = 54.375

54.375cm

Modal Class - Video 56a

385. Write down the modal class interval.

Length (cm)	Frequency
0 ≤ L < 30	8
30 ≤ L < 60	43
60 ≤ L < 90	25
90 ≤ L < 120	4

30 ≤ L < 60

Class containing Median - Video 52a

386. Which class interval contains the median?

Length (cm)	Frequency	
0 ≤ L < 30	8	x
30 ≤ L < 60	43	✓
60 ≤ L < 90	25	
90 ≤ L < 120	4	
	80	

80/2 = 40th

30 ≤ L < 60

Combined Mean - Video 53a

387. There are 40 houses in Greenvale and 60 houses in Redville.

40 + 60 = 100

The mean number of cars per house in Greenvale is 1.5
The mean number of cars per house in Redville is 3

Work out the mean number of cars per house in both villages.

40 x 1·5 = 60

60 x 3 = 180

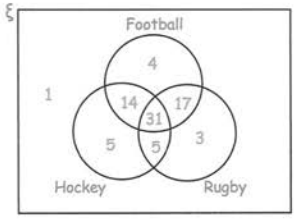
240

240 ÷ 100 = 2·4

2·4

Venn Diagrams - Video 380

388. Jennifer asked 80 people which sports they enjoy from football, hockey and rugby.



How many people enjoy all three sports?

31

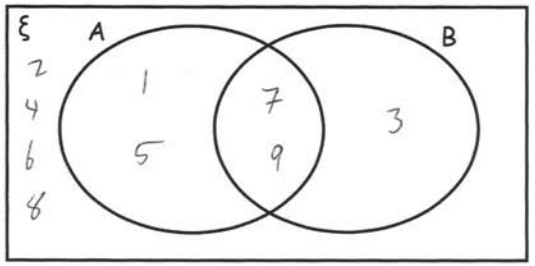
How many people enjoy football and rugby but not hockey?

17

389. ξ = {1, 2, 3, 4, 5, 6, 7, 8, 9}

A = {1, 5, 7, 9}
B = {3, 7, 9}

Complete the Venn diagram



A number is chosen at random, find the probability of:

390. P(A') Not A

5/9

391. P(A∪B) A or B

5/9

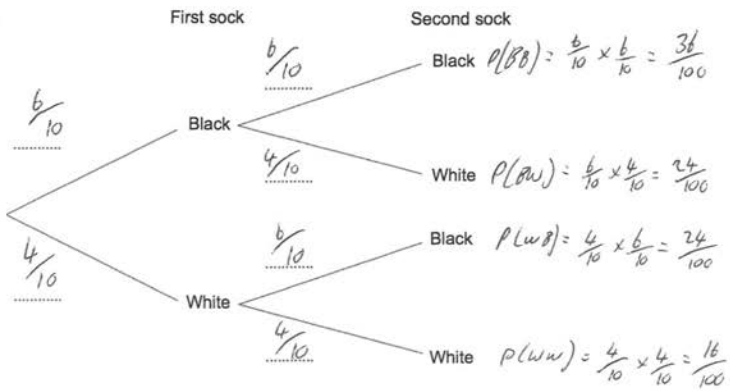
392. P(A∩B) A and B

2/9

Tree Diagrams - Video 252

Siobhan has 10 socks in a drawer.
6 socks are black and 4 socks are white.
She picks a sock at random, puts it back and then takes out a second at random.

393. Complete the tree diagram.



394. Work out the probability that the two socks are both white.

16/100 or 8/50 or 4/25

395. Work out the probability that the two socks are the same colour.

36/100 + 16/100 = 52/100

52/100 or 13/25

396. Work out the probability that the two socks are different colours.

48/100 or 12/25

Reading Tables - Video 387

Name	Price (£)	Mass (kg)	Thickness (cm)	Battery (minutes)
Epic	£799	1.23	1.89	690
Bell	£1249	1.2	1.52	650
Lemon	£1599	1.37	1.49	720
HB	£799	1.28	1.7	740 ✓
Lazer	£1049	1.35	1.66	660 ✓

397. Which laptop is the thinnest?

Lemon

398. How much longer does the HB battery last than the Lazer battery?

740 - 660

80 mins

Samples - Video 281a

Mrs Martin wants to open a new restaurant in her town.
She wants to find out what type of food people in her town like.

399. Caolán suggests that she posts a survey to 100 people chosen at random across the country.

Explain why this is not sensible.

As they are across the whole country, it may not represent local views.

400. Jack suggests that she surveys 5 people in the town centre.

Explain how Jack's suggestion could be improved.

Survey more people.