Weekly check: Year 8 part 3

Worked solutions

KS3 Maths weekly check

This check online

1 A spinner can land on red, blue, green or yellow.

The table shows the probabilities for three of the colours.

Colour	red	blue	green	yellow
Probability	0.2	0.35	0.1	

Work out the probability that the spinner lands on yellow. (2 marks)

Probabilities add up to 1

$0.2 + 0.35 + 0.1 = 0.65$

$P(\text{yellow}) = 1 - 0.65$

$P(\text{yellow}) = 0.35$

0.35

2 The stem and leaf diagram shows the number of press-ups 11 students did in one minute.

Stem	**Leaves**
0	6 8
1	1 3 5 7 9
2	2 4 6 8

Key: 1 | 1 = 11 press-ups

a. Find the median number of press-ups.

b. Find the range of the number of press-ups. (3 marks)

a)

11 values, so median is the 6th

$(11 + 1) \div 2 = 6$

6, 8, 11, 13, 15, 17

17

b)

Range = 28 − 6

Range = 22

22

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3 A house is worth £240 000. Its value increases by 4% each year.

Work out the value of the house after 3 years. Give your answer to the nearest pound. (3 marks)

multiplier for +4% is 1.04

3 years, so multiply by 1.04 three times

$1.04^3 = 1.124864$

$240000 \times 1.124864 = 269967.36$

nearest pound

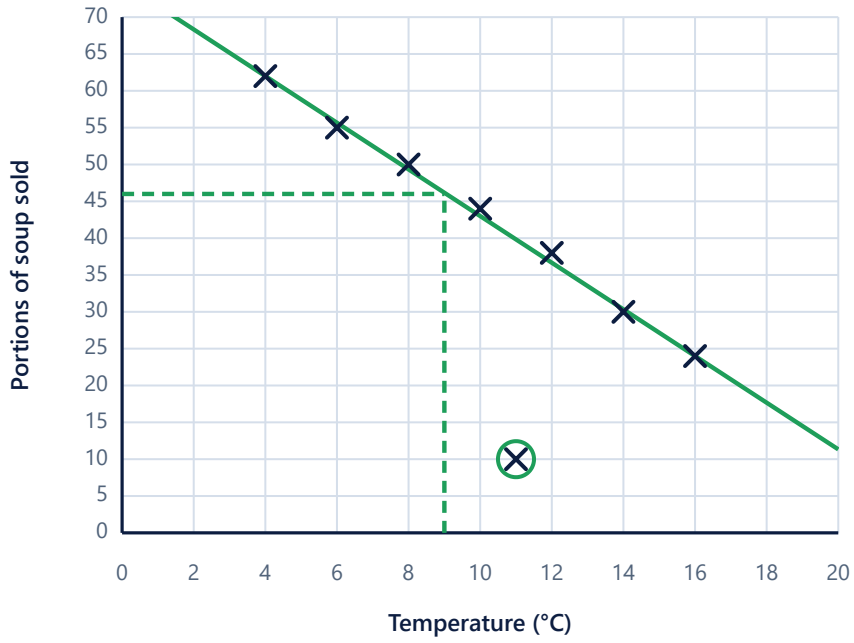
£269 967

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4 The scatter graph shows the outside temperature, in °C, and the number of portions of soup sold by a cafe on each of 8 days.

a. One of the points is an outlier. Write down the coordinates of this point.

b. Ignoring the outlier, use the graph to estimate the number of portions of soup sold on a day when the outside temperature is 9 °C.



(3 marks)

a)

Trend: soup sales fall as temperature rises

(11, 10) is far below the trend

(11, 10)

b)

Line of best fit, ignoring (11, 10)

Go up from 9 °C to the line

Go across to the portions axis

Reading: about 46 or 47

About 47 portions (accept 44 to 50)

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5 Year 8 grew 30 sunflowers. The table shows information about their heights, h cm.

Height (h cm)	Frequency
$0 < h \leq 50$	3
$50 < h \leq 100$	7
$100 < h \leq 150$	12
$150 < h \leq 200$	8

a. Write down the modal class.

b. Write down the class interval that contains the median.

c. Work out an estimate for the mean height. Give your answer to 1 decimal place.

(4 marks)

a) highest frequency is 12

$100 < h \leq 150$

b) median is between the 15th and 16th

$3 + 7 = 10$

$10 + 12 = 22$

$100 < h \leq 150$

c) midpoint x frequency

$25 \times 3 = 75$

$75 \times 7 = 525$

$125 \times 12 = 1500$

$175 \times 8 = 1400$

$\text{total} = 3500$

$3500 \div 30 = 116.66...$

116.7 cm

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6 The mean of 8 numbers is 12.

The mean of 5 of these numbers is 9.

Work out the mean of the other 3 numbers.

(3 marks)

Total of 8 = 8 × 12

Total of 8 = 96

Total of 5 = 5 × 9

Total of 5 = 45

Total of 3 = 96 − 45

Total of 3 = 51

Mean = 51 ÷ 3

Mean = 17

17

7 Triangle ABC is similar to triangle PQR.

AB corresponds to PQ, and BC corresponds to QR.

AB = 6 cm, PQ = 9 cm and BC = 8 cm.

Work out the length of QR.

(2 marks)

Scale factor = PQ ÷ AB

Scale factor = 9 ÷ 6

Scale factor = 1.5

QR = BC × 1.5

QR = 8 × 1.5

QR = 12

12 cm

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8 A skate ramp is made of concrete. It is a triangular prism. The cross-section is a right-angled triangle with base 3 m and height 1.2 m. The ramp is 2.5 m wide.

Concrete costs £95 per m^3.

Work out the cost of the concrete for the ramp.

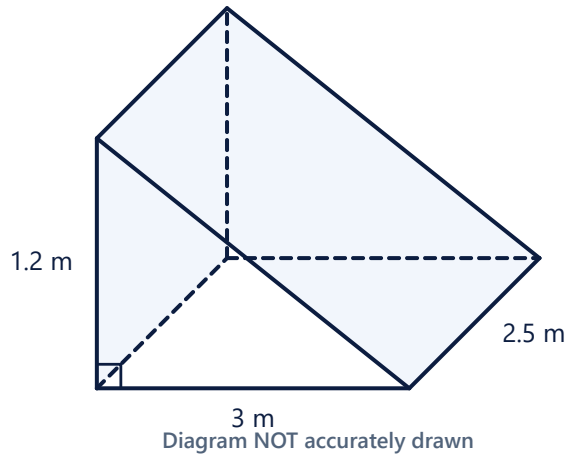


Diagram NOT accurately drawn

(3 marks)

area of cross-section

$$A = \frac{1}{2} \times 3 \times 1.2$$

$$A = 1.8\ m^2$$

$$V = 1.8 \times 2.5$$

$$V = 4.5\ m^3$$

$$4.5 \times 95 = 427.50$$

£427.50

9 Lena says, "If two triangles have the same three angles, they must be congruent."

a. Write down the four conditions that do show two triangles are congruent.

b. Explain why Lena is wrong.

(2 marks)

a)

SSS, SAS, ASA, RHS

b)

Same angles = same shape, but not always the same size

e.g. sides 3, 4, 5 and sides 6, 8, 10 have equal angles

AAA only shows the triangles are similar

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10 The table shows the shoe sizes of the students in a year group.

Shoe size	Frequency
4	5
5	9
6	12
7	8
8	6

a. Write down the modal shoe size.

b. Work out the number of students in the year group.

c. Work out how many students have a shoe size of 7 or larger.

(3 marks)

a)

Mode = size with the highest frequency

Highest frequency is 12

6

b)

Add the frequencies

Total = 5 + 9 + 12 + 8 + 6

Total = 40

40

c)

Sizes 7 and 8

8 + 6 = 14

14

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11 The ratio of a distance in miles to the same distance in kilometres is 5 : 8.

a. A cycle race is 40 miles long. Work out the length of the race in kilometres.

b. Sienna runs 12 km. Work out how far she runs in miles.

(3 marks)

a) miles : km = 5 : 8

40 ÷ 5 = 8

8 × 8 = 64

64 km

b)

12 ÷ 8 = 1.5

5 × 1.5 = 7.5

7.5 miles

12 Write down whether each type of data is **discrete** or **continuous**.

a. The number of pupils in a class

b. The mass of an apple

c. The time taken to run 100 m

d. The number of goals scored in a football match

(2 marks)

counted = discrete, measured = continuous

a) counted

discrete

b) measured

continuous

c) measured

continuous

d) counted

discrete

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13 Rectangle A measures 4 cm by 6 cm.

Rectangle B is mathematically similar to rectangle A. The shorter side of rectangle B is 10 cm.

a. Work out the scale factor of the enlargement from A to B.

b. Work out the length of the longer side of rectangle B.

(2 marks)

a)

scale factor = 10 ÷ 4

scale factor = 2.5

2.5

b)

Longer side = 6 × 2.5

Longer side = 15

15 cm

14 Work out 30% of 60% of £250

(2 marks)

60% of £250 = 0.6 × 250

60% of £250 = £150

30% of £150 = 0.3 × 150

30% of £150 = £45

£45

15 a. A games console costs £280. The price goes up by 12%. Use a multiplier to work out the new price.

b. A winter coat costs £75. In a sale the price is reduced by 30%. Use a multiplier to work out the sale price.

(3 marks)

a) 100% + 12% = 112%

280 × 1.12 = 313.60

£313.60

b) 100% - 30% = 70%

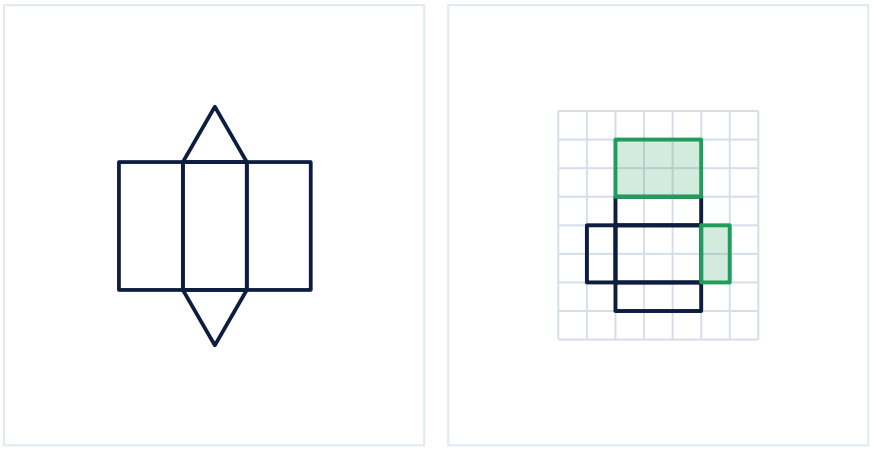
75 × 0.7 = 52.50

£52.50

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16 a. Diagram **a** shows the net of a 3D solid. Write down the name of the solid.

b. Diagram **b** shows part of the net of a cuboid that measures 3 cm by 2 cm by 1 cm, drawn on a centimetre grid. Two faces are missing. On the grid, draw the two missing faces to complete the net.



a *b*

(3 marks)

a) 2 triangles + 3 rectangles

triangular prism

b) a cuboid has 3 pairs of faces

given: one 3 by 2, one 1 by 2, two 3 by 1

missing: a 1 by 2 face and a 3 by 2 face

1 by 2 goes on the right of the 3 by 2 face

3 by 2 goes on top of the top 3 by 1 face

net complete: 6 faces

17 A shop sells two sizes of box of teabags.

Small box: 80 teabags for £2.40

Large box: 240 teabags for £6.60

Which box is the better value for money? Show your working.

(3 marks)

Cost of one teabag

Small: 240p ÷ 80 = 3p

Large: 660p ÷ 240 = 2.75p

2.75p < 3p

Large box: 2.75p per teabag, not 3p

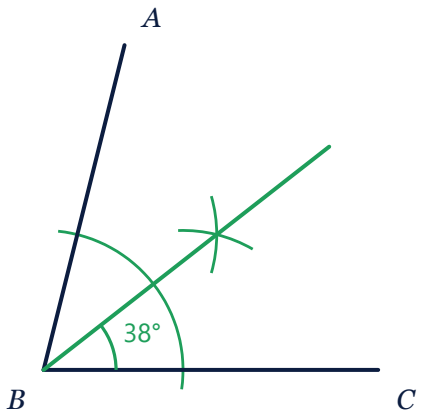
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18 The diagram shows angle ABC.

Using a ruler and compasses only, construct the bisector of angle ABC.

You must show all your construction lines.

Then use a protractor to measure one of the two angles your bisector makes.



(2 marks)

Compass point on B: one arc crossing both arms

Same radius from each crossing point: arcs cross inside the angle

Join B to where the arcs cross

$76^\circ \div 2 = 38^\circ$

Bisector drawn, each half 38°

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19 Here is a sketch of an equilateral triangle with sides of 6 cm.

Using a ruler and compasses only, construct the triangle accurately in the space below. You must show all your construction arcs.

Write down the size of each angle in your triangle.

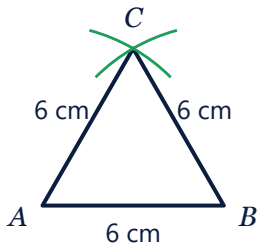


Diagram NOT accurately drawn

(2 marks)

Draw AB = 6 cm

Compasses set to 6 cm

Arc from A, arc from B: they cross at C

Join AC and BC

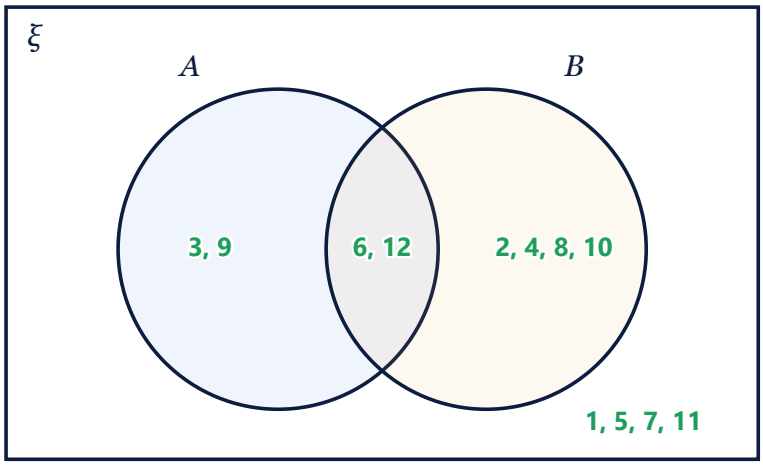
$180^\circ \div 3 = 60^\circ$

Each angle is 60°

20 $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$

A = {multiples of 3} B = {even numbers}

Complete the Venn diagram.



(3 marks)

A = {3, 6, 9, 12}

B = {2, 4, 6, 8, 10, 12}

A and B) In both sets

6, 12

A only) In A but not B

3, 9

B only) In B but not A

2, 4, 8, 10

outside) The numbers left over

1, 5, 7, 11

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