Weekly check: Year 8 part 1

Worked solutions

KS3 Maths weekly check

This check online

1 a. A regular hexagon has sides of 7 cm. Work out its perimeter.

b. A regular pentagon has a perimeter of 45 cm. Work out the length of one side.

c. Work out the perimeter of the quadrilateral in the diagram.

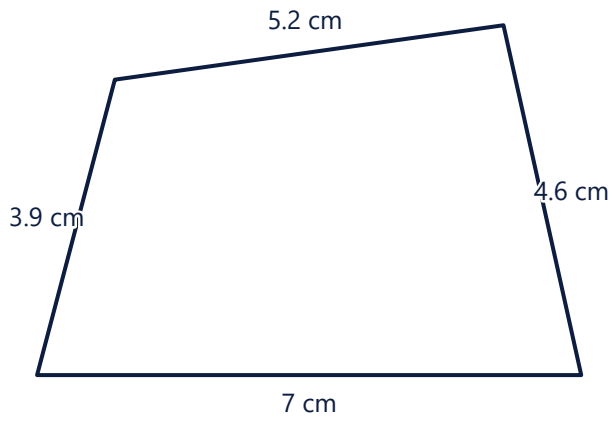


Diagram NOT accurately drawn

(3 marks)

a) 6 equal sides

$6 \times 7 = 42$

42 cm

b) 5 equal sides

$45 \div 5 = 9$

9 cm

c) Add all the sides

$7 + 4.6 + 5.2 + 3.9 = 20.7$

20.7 cm

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2 Work out $\sqrt{49} + 2^3 \times 3$ (2 marks)

Roots and powers first

$\sqrt{49} + 2^3 \times 3 = 7 + 8 \times 3$

Then multiply

$= 7 + 24$

$= 31$

31

3 a. Write $2^3 \times 2^4$ as a single power of 2

b. Jamal says, "$2^3 + 2^4 = 2^7$".
Show that Jamal is wrong. (3 marks)

a) Same base, × means add the powers

$2^3 \times 2^4 = 2^{3+4}$

$= 2^7$

2^7

b) Work out each side

$2^3 + 2^4 = 8 + 16$

$= 24$

$2^7 = 128$

$24 \neq 128$, adding powers does not add the indices

Jamal is wrong

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4

a. Write $3\frac{2}{5}$ as an improper fraction.

b. Write $\frac{29}{6}$ as a mixed number.

(2 marks)

a)

$3 \times 5 = 15$

$15 + 2 = 17$

$\frac{17}{5}$

b)

$29 \div 6 = 4$ remainder 5

$4\frac{5}{6}$

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5 A rectangle is 12 cm long and 9 cm wide.

A rectangle 5 cm by 4 cm is removed from one corner.

Work out the area of the remaining shape.

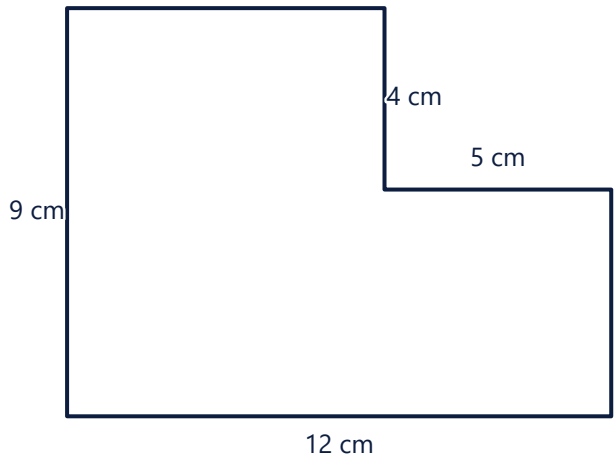


Diagram NOT accurately drawn

(3 marks)

Full rectangle

$A = 12 \times 9$

$A = 108$

Corner removed

$A = 5 \times 4$

$A = 20$

Remaining $= 108 - 20$

Remaining $= 88$

$88\ cm^2$

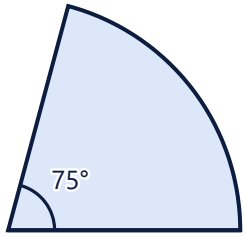
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6 A slice of a round cheese is a sector of a circle with radius 12 cm and angle 75°.

a. Work out the length of the curved edge (the arc) of the slice.

b. Work out the perimeter of the slice.

Give your answers correct to 1 decimal place.



12 cm

Diagram NOT accurately drawn

(3 marks)

a)

$$\text{Arc} = \frac{75}{360} \times \pi \times 24$$

$$= 15.70...$$

15.7 cm

b) Arc + two radii

$$15.70... + 12 + 12 = 39.70...$$

39.7 cm

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7 Use your calculator to work out

$(2.4^2 + 1.8) \div 0.5^3$

Write down all the figures on your calculator display. (2 marks)

Top first

$2.4^2 = 5.76$

$5.76 + 1.8 = 7.56$

Then the power

$0.5^3 = 0.125$

$7.56 \div 0.125 = 60.48$

$\boxed{60.48}$

8 A circle has diameter 18 cm.

a. Work out the circumference of the circle. Give your answer in terms of π.

b. Work out the area of the circle. Give your answer in terms of π. (3 marks)

a)

$C = \pi d$

$C = \pi \times 18$

$\boxed{18\pi \text{ cm}}$

b)

$r = 18 \div 2$

$r = 9$

$A = \pi r^2$

$A = \pi \times 9^2$

$\boxed{81\pi \text{ cm}^2}$

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9 An L-shape is made by removing a rectangle 3 cm by 2 cm from one corner of a rectangle 8 cm by 6 cm.

Work out the perimeter of the L-shape.

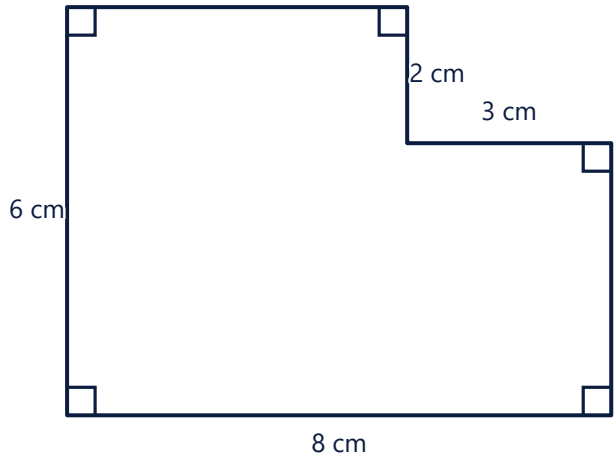


Diagram NOT accurately drawn

(3 marks)

Find the missing sides

Top side = 8 - 3

Top side = 5 cm

Right side = 6 - 2

Right side = 4 cm

Add all six sides

P = 8 + 4 + 3 + 2 + 5 + 6

P = 28

28 cm

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10 A number x is 470, correct to 2 significant figures.

Complete the error interval for x.

..... ≤ x < .....

(2 marks)

2 sf of 470 is the nearest 10

Half of 10 is 5

Lower bound = 470 − 5

Lower bound = 465

Upper bound = 470 + 5

Upper bound = 475

$465 \leq x < 475$

11 Write 264 as a product of its prime factors.

(2 marks)

Divide by primes

264 ÷ 2 = 132

132 ÷ 2 = 66

66 ÷ 2 = 33

33 ÷ 3 = 11

11 is prime

$264 = 2 \times 2 \times 2 \times 3 \times 11$

$264 = 2^3 \times 3 \times 11$

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12 Choose the correct symbol, <, > or =, to make each statement true.

a. $\frac{3}{5}$ ___ $\frac{7}{10}$

b. $\frac{4}{6}$ ___ $\frac{2}{3}$

(2 marks)

a)

Make the denominators the same

$\frac{3}{5} = \frac{6}{10}$

$\frac{6}{10} < \frac{7}{10}$

$\boxed{\frac{3}{5} < \frac{7}{10}}$

b)

÷ 2 top and bottom

$\frac{4}{6} = \frac{2}{3}$

$\boxed{\frac{4}{6} = \frac{2}{3}}$

13 Here is a list of numbers.

6 8 9 16 21 27 28 49 125

From the list, write down

a. the square numbers

b. the cube numbers

c. the triangle numbers

(3 marks)

a) Square numbers

1, 4, 9, 16, 25, 36, 49, ...

$\boxed{9, 16, 49}$

b) Cube numbers

1, 8, 27, 64, 125

$\boxed{8, 27, 125}$

c) Triangle numbers: add 2, then 3, then 4, ...

1, 3, 6, 10, 15, 21, 28, 36

$\boxed{6, 21, 28}$

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14 a. Write 600 as a product of its prime factors. Give your answer in index form.

b. Hence write 1200 as a product of its prime factors in index form.

(3 marks)

a)

$600 = 2 \times 300$

$300 = 2 \times 150$

$150 = 2 \times 75$

$75 = 3 \times 25$

$25 = 5 \times 5$

$600 = 2 \times 2 \times 2 \times 3 \times 5 \times 5$

$\boxed{600 = 2^3 \times 3 \times 5^2}$

b)

$1200 = 2 \times 600$

One more 2

$\boxed{1200 = 2^4 \times 3 \times 5^2}$

15 Work out the missing number in each calculation.

a. $-8 \times \square = 56$

b. $\square \div (-3) = 6$

(2 marks)

a) Use the inverse, ÷ by -8

$56 \div -8 = -7$

Check: $-8 \times -7 = 56$

$\boxed{-7}$

b) Use the inverse, × by -3

$6 \times -3 = -18$

Check: $-18 \div -3 = 6$

$\boxed{-18}$

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16 A circular coaster has a diameter of 10 cm.

a. Work out the circumference of the coaster.

b. Work out the area of the coaster.

Give each answer correct to 1 decimal place. (3 marks)

a)

$C = \pi d$

$C = \pi \times 10 = 31.415...$

$\boxed{31.4 \text{ cm}}$

b) Radius first

$r = 10 \div 2 = 5$

$A = \pi r^2$

$A = \pi \times 5^2 = 78.539...$

$\boxed{78.5 \text{ cm}^2}$

17 a. Write down the denominator of the fraction $\frac{15}{35}$

b. Write $\frac{15}{35}$ in its simplest form.

c. Write $\frac{24}{36}$ in its simplest form. (3 marks)

a) Denominator = the bottom number

$\boxed{35}$

b) ÷ 5 top and bottom

$\frac{15}{35} = \frac{3}{7}$

$\boxed{\frac{3}{7}}$

c) HCF of 24 and 36 is 12, so ÷ 12 top and bottom

$\frac{24}{36} = \frac{2}{3}$

$\boxed{\frac{2}{3}}$

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18 a. Work out 15 − 6 + 4

b. Work out 30 ÷ 5 × 3

(2 marks)

a) + and − are equal, go left to right

$15 - 6 + 4 = 9 + 4$

$= 13$

13

b) × and ÷ are equal, go left to right

$30 \div 5 \times 3 = 6 \times 3$

$= 18$

18

19 The mass of a cat is 8.3 kg, correct to 1 decimal place.

Complete the error interval for the mass, w kg, of the cat.

..... ≤ w < .....

(2 marks)

1 dp: half of 0.1 is 0.05

Lower bound = 8.3 − 0.05

Lower bound = 8.25

Upper bound = 8.3 + 0.05

Upper bound = 8.35

$8.25 \leq w < 8.35$

20 Here are the temperatures, in °C, at 6 am on five days in January.

−4 −1 2 −3 −4

Work out the mean temperature.

(2 marks)

Add them up

$-4 - 1 + 2 - 3 - 4 = -10$

Divide by how many

$-10 \div 5 = -2$

$-2\,^{\circ}C$

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