Weekly check: Year 9 part 1

Worked solutions

KS3 Maths weekly check

This check online

1 Work out an estimate for the value of

$$\frac{39.6 \times 5.12}{0.48}$$

You must show your working. (3 marks)

round each number to 1 s.f.

$$\frac{39.6 \times 5.12}{0.48} \approx \frac{40 \times 5}{0.5}$$

$40 \times 5 = 200$

$200 \div 0.5 = 400$

400

2 Kofi makes two jugs of orange squash.

Jug A: 150 ml of squash mixed with 600 ml of water.

Jug B: 200 ml of squash mixed with 900 ml of water.

Which jug has the stronger taste of orange? Show your working by writing each ratio of squash to water in the form $1 : n$ (2 marks)

Jug A ÷ 150

150 : 600 = 1 : 4

Jug B ÷ 200

200 : 900 = 1 : 4.5

Less water for each 1 ml of squash

Jug A

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3 a. Work out $\frac{3}{5}$ of 2 km. Give your answer in metres.

b. Work out $\frac{5}{12}$ of an hour. Give your answer in minutes.

c. Sana has a 2 kg bag of flour. She uses $\frac{3}{8}$ of the flour to bake bread. How many grams of flour are left in the bag?

(3 marks)

a)

2 km = 2000 m

2000 ÷ 5 = 400

400 x 3 = 1200

1200 m

b)

1 hour = 60 minutes

60 ÷ 12 = 5

5 x 5 = 25

25 minutes

c)

2 kg = 2000 g

2000 ÷ 8 = 250

Used: 250 x 3 = 750 g

Left: 2000 - 750 = 1250 g

1250 g

4 Write

a. 0.4 as a percentage,

b. 135% as a decimal.

(2 marks)

a)

0.4 x 100 = 40

40%

b)

135 ÷ 100 = 1.35

1.35

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5 Work out $3\frac{1}{3} \div 2\frac{1}{2}$

Give your answer as a mixed number in its simplest form. (3 marks)

Improper fractions

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

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

Flip the second, then multiply

$$\frac{10}{3} \div \frac{5}{2} = \frac{10}{3} \times \frac{2}{5}$$

$$\frac{10}{3} \div \frac{5}{2} = \frac{20}{15}$$

$$\frac{20}{15} = \frac{4}{3}$$

$4 \div 3 = 1$ remainder 1

$$\frac{4}{3} = 1\frac{1}{3}$$

$$\boxed{1\frac{1}{3}}$$

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6 Work out each of these. Give each answer in its simplest form.

a. $\frac{4}{5} \div 2$

b. $\frac{3}{7} \div 6$

c. $\frac{5}{8} \div \frac{15}{16}$

(3 marks)

a)

$$\frac{4}{5} \div 2 = \frac{4}{5} \times \frac{1}{2}$$

$$= \frac{4}{10}$$

$$\boxed{\frac{2}{5}}$$

b)

$$\frac{3}{7} \div 6 = \frac{3}{7} \times \frac{1}{6}$$

$$= \frac{3}{42}$$

$$\boxed{\frac{1}{14}}$$

c)

$$\frac{5}{8} \div \frac{15}{16} = \frac{5}{8} \times \frac{16}{15}$$

Cancel 5 with 15, 16 with 8

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

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

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7 a. Write $(5^3)^4$ as a single power of 5

b. Write down the value of 8^0

(2 marks)

a)

Power of a power: multiply

$(5^3)^4 = 5^{3 \times 4}$

$= 5^{12}$

$\boxed{5^{12}}$

b)

Anything to the power 0 is 1

$8^0 = 1$

$\boxed{1}$

8 Work out $(9 \times 10^8) \div (3 \times 10^{-2})$

Give your answer in standard form.

(2 marks)

Divide numbers, subtract powers

$9 \div 3 = 3$

$10^8 \div 10^{-2} = 10^{8-(-2)}$

$10^8 \div 10^{-2} = 10^{10}$

$\boxed{3 \times 10^{10}}$

9 a. Write the ratio 8 : 28 in the form 1 : n

b. A school has 15 teachers and 360 pupils. Write the ratio of teachers to pupils in the form 1 : n

(2 marks)

a)

÷ both sides by 8

8 : 28

1 : 3.5

$\boxed{1 : 3.5}$

b)

÷ both sides by 15

15 : 360

1 : 24

$\boxed{1 : 24}$

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10 Write

a. 35% as a fraction in its simplest form,

b. $\frac{3}{25}$ as a percentage.

(2 marks)

a)

$35\% = \frac{35}{100}$

÷ top and bottom by 5

$\frac{35}{100} = \frac{7}{20}$

$\boxed{\frac{7}{20}}$

b)

x top and bottom by 4

$\frac{3}{25} = \frac{12}{100}$

$\boxed{12\%}$

11 Ravi is choosing between two vouchers for the same online shop.

Voucher A gives 24% off a £75 order.

Voucher B gives 32% off a £55 order.

Which voucher saves more money?

You must show your working.

(3 marks)

Voucher A saving

24% of £75 = 0.24 x 75

24% of £75 = £18

Voucher B saving

32% of £55 = 0.32 x 55

32% of £55 = £17.60

£18 > £17.60

$\boxed{\text{Voucher A (saves £18, B saves £17.60)}}$

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12 Write down two numbers, both greater than 20, whose highest common factor (HCF) is 7 (2 marks)

Multiples of 7 above 20

21, 28, 35, 42, ...

$21 = 3 \times 7$

$28 = 4 \times 7$

3 and 4 share no factor except 1

$HCF(21, 28) = 7$

e.g. 21 and 28

13 Ellie scored 17 out of 20 in a French test. She scored 42 out of 50 in a Spanish test.
In which test did Ellie do better? You must show your working. (3 marks)

French

$$\frac{17}{20} = \frac{85}{100}$$

$$= 85\%$$

Spanish

$$\frac{42}{50} = \frac{84}{100}$$

$$= 84\%$$

$85\% > 84\%$

French

14 a. Work out an estimate for 62.3 × 4.87

b. You are given that 623 × 487 = 303,401
Use this fact to write down the exact value of 62.3 × 4.87

(3 marks)

a)

$62.3 \approx 60, 4.87 \approx 5$

$60 \times 5 = 300$

300

b)

$62.3 = 623 \div 10$

$4.87 = 487 \div 100$

$62.3 \times 4.87 = 303{,}401 \div 1000$

$62.3 \times 4.87 = 303.401$

Close to 300, so sensible

303.401

15 3 identical machines take 10 hours to print an order of leaflets.
Work out how long 5 of these machines would take to print the same order.

(2 marks)

Total work in machine-hours

$3 \times 10 = 30$

Share the work between 5 machines

$30 \div 5 = 6$

6 hours

16 Rosa puts £3000 into a savings account.
The account pays 2% compound interest per year.
Work out the value of her savings at the end of 2 years.

(2 marks)

Multiplier for +2%

$100\% + 2\% = 102\%$

Multiplier $= 1.02$

Value $= 3000 \times 1.02^2$

Value $= 3121.2$

£3121.20

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17 a. Write 507,000 in standard form.

b. Write 2.6×10^{-3} as an ordinary number. (2 marks)

a)

$507{,}000 = 5.07 \times 100{,}000$

$507{,}000 = 5.07 \times 10^5$

$\boxed{5.07 \times 10^5}$

b)

$2.6 \times 10^{-3} = 2.6 \div 1000$

Digits move 3 places right

$\boxed{0.0026}$

18 Work out how many positive whole numbers less than 100 are multiples of both 4 and 6. (3 marks)

Multiples of 4 and 6

4: 4, 8, 12, ...

6: 6, 12, ...

LCM = 12

Multiples of 12 under 100

12, 24, 36, 48, 60, 72, 84, 96

$\boxed{8}$

19 a. Kai scored 18 out of 25 in a spelling test. Write his score as a percentage.

b. Write £6 as a percentage of £40 (2 marks)

a)

$\frac{18}{25} = \frac{72}{100}$

$\boxed{72\%}$

b)

$\frac{6}{40} = \frac{3}{20}$

$\frac{3}{20} = \frac{15}{100}$

$\boxed{15\%}$

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20 Tia and Sam each ran 100 m.

Tia's time was 12.4 seconds, correct to 1 decimal place.

Sam's time was 12.4 seconds, truncated to 1 decimal place.

a. Write down the error interval for Tia's time, t seconds.

b. Write down the error interval for Sam's time, s seconds.

c. Tia says, "I definitely ran faster than Sam." Is Tia right? Give a reason for your answer.

(4 marks)

a) rounding: half of 0.1 either side

$12.4 - 0.05 = 12.35$

$12.4 + 0.05 = 12.45$

$12.35 \leqslant t < 12.45$

b) truncating: up to the next 0.1

$12.4 \leqslant s < 12.5$

c) the intervals overlap

Tia could be 12.44, Sam could be 12.40

No, Sam could have been faster

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