

Year 8 maths worksheet

Year 8 | KS3

Name _____ Class _____ Date _____

Score _____ / 24

Show your working in the space and write each answer in the box. Questions 1–23 are non-calculator; a calculator is allowed for question 24 only.

Example: increase £40 by 15%. The multiplier is $1 + 0.15 = 1.15$, so $40 \times 1.15 = £46$.

Section A · Number and algebra fluency

1. $-3 - (-8) =$

2. $(-12) \div (-4) =$

3. $2^3 + 3^2 =$

4. $\frac{3}{4} \times \frac{2}{9} =$

5. $\frac{5}{6} \div \frac{2}{3} =$

6. Expand $4(2x - 3)$.

7. Factorise fully $6x + 15$.

8. Write 72 as a product of its prime factors.

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Section B · Reasoning

9. Increase £60 by 15%.

10. Decrease 250 kg by 12%.

11. Solve $5x - 7 = 18$.

12. Solve $3(x + 2) = 24$.

13. Simplify the ratio 45 : 60.

14. Find the sum of the interior angles of a pentagon.

15. A triangle has a base of 9 cm and a perpendicular height of 6 cm. Find its area.

16. Find the size of each exterior angle of a regular hexagon.

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Section C · Problem solving

- 17.** A recipe for 4 people uses 300 g of flour. How much flour is needed for 10 people?

Answer

- 18.** A car travels 135 km in 1.5 hours. Find its average speed.

Answer

- 19.** The probability that it rains tomorrow is 0.35. Find the probability that it does not rain.

Answer

- 20.** The mean of five numbers is 8. Four of the numbers are 6, 9, 7 and 10. Find the fifth number.

Answer

- 21.** Find the volume of a cuboid measuring 4 cm by 5 cm by 6 cm.

Answer

- 22.** Convert 3.2 litres to millilitres.

Answer

- 23.** Write 45 000 in standard form.

Answer

- 24.** Calculator: find the area of a circle with radius 5 cm. Give your answer to 1 decimal place.

Answer

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Check each answer and its method. Equivalent forms are correct unless a question asks for a particular form or degree of accuracy.

Section A · Number and algebra fluency

1. **5**

Subtracting a negative is the same as adding: $-3 + 8 = 5$.

2. **3**

A negative divided by a negative is positive: $12 \div 4 = 3$.

3. **17**

$2^3 = 8$ and $3^2 = 9$, so $8 + 9 = 17$.

4. **$\frac{1}{6}$**

Multiply numerators and denominators: $\frac{6}{36}$, which simplifies to $\frac{1}{6}$.

5. **$\frac{5}{4} = 1 \frac{1}{4}$**

Multiply by the reciprocal: $\frac{5}{6} \times \frac{3}{2} = \frac{15}{12} = \frac{5}{4} = 1 \frac{1}{4}$.

6. **$8x - 12$**

Multiply each term inside the bracket by 4: $4 \times 2x = 8x$ and $4 \times (-3) = -12$.

7. **$3(2x + 5)$**

The highest common factor of $6x$ and 15 is 3 : $6x + 15 = 3(2x + 5)$.

8. **$2^3 \times 3^2$**

$72 = 8 \times 9 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2$.

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Section B · Reasoning

9. £69

15% of £60 is £9, so $£60 + £9 = £69$. Or use the multiplier: $60 \times 1.15 = 69$.

10. 220 kg

12% of 250 is 30, so $250 - 30 = 220$ kg. Or use the multiplier: $250 \times 0.88 = 220$.

11. $x = 5$

Add 7 to both sides: $5x = 25$. Divide by 5: $x = 5$.

12. $x = 6$

Divide both sides by 3: $x + 2 = 8$. Subtract 2: $x = 6$.

13. 3 : 4

Divide both parts by their highest common factor, 15: $45 \div 15 = 3$ and $60 \div 15 = 4$.

14. 540°

A pentagon splits into 3 triangles: $(5 - 2) \times 180^\circ = 540^\circ$.

15. 27 cm^2

Area = $\frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 9 \times 6 = 27 \text{ cm}^2$.

16. 60°

Exterior angles of any polygon sum to 360° . A hexagon has 6, so $360^\circ \div 6 = 60^\circ$.

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Section C · Problem solving

17. 750 g

One person needs $300 \div 4 = 75$ g. For 10 people: $75 \times 10 = 750$ g.

18. 90 km/h

Speed = distance $\div$ time = $135 \div 1.5 = 90$ km/h.

19. 0.65

Probabilities of all outcomes sum to 1: $1 - 0.35 = 0.65$.

20. 8

The five numbers total $5 \times 8 = 40$. The four given total 32, so the fifth is $40 - 32 = 8$.

21. 120 cm³

Volume = length $\times$ width $\times$ height = $4 \times 5 \times 6 = 120$ cm³.

22. 3200 ml

1 litre = 1000 ml, so $3.2 \times 1000 = 3200$ ml.

23. 4.5×10^4

Place the decimal point after the first digit: 4.5, then count the 4 places moved: 4.5×10^4 .

24. 78.5 cm²

Area = $\pi r^2 = \pi \times 5^2 = 25\pi = 78.539\dots$, so 78.5 cm² to 1 d.p.