Maths Year 10 — Practice Exam 4 — Answers & Explanations

Answers to the 30 questions in the free preview.

Numeracy — non-calculator

1. Answer: 10
The distance between −6 and 4 is 4 − (−6) = 10 degrees.

2. Answer: 2
The line rises 2 units for every 1 unit across, so the gradient is 2. It is also the coefficient of x in y = 2x − 3.

3. D. 4 m
An index of 1/2 means the square root, and √16 = 4 metres. Option B halves 16 instead of taking the root.

4. D. 10 cm
By Pythagoras, the hypotenuse squared is $6^2 + 8^2 = 36 + 64 = 100$, so the hypotenuse is 10 cm.

5. Answer: 5
$5^2 = 25$ and $6^2 = 36$, so √30 lies between 5 and 6. The smaller whole number is 5.

6. A. 3/4
The outcomes are HH, HT, TH and TT. Three of the four include a tail, so the probability is 3/4.

7. A. $y = 200 \times 0.5^x$
Halving repeatedly is exponential decay: the starting value is multiplied by 0.5 once per year, giving $y = 200 \times 0.5^x$. Option B decreases by a fixed amount rather than a fixed proportion.

8. B. four times as large
Volume = $\pi r^2 h$. Doubling r squares to give $4r^2$, so the volume is multiplied by 4. The height is unchanged and contributes no extra factor.

9. Answer: 6
Area = $\sqrt{12} \times \sqrt{3} = \sqrt{36} = 6$ cm². Alternatively $2\sqrt{3} \times \sqrt{3} = 2 \times 3 = 6$.

10. B. 30 minutes
The interquartile range is 18 − 10 = 8, and 1.5 × 8 = 12. The upper fence is 18 + 12 = 30 minutes.

11. D. (−4, −7)
In the form $y = (x - h)^2 + k$ the turning point is (h, k). Here h = −4 and k = −7, so the turning point is (−4, −7).

12. C. 250°
The back bearing differs by 180°: 070° + 180° = 250°.

13. D. 4π cm²
A 90° sector is a quarter of the circle. The whole circle has area $\pi \times 4^2 = 16\pi$, so the sector is 4π cm².

14. C. 130π cm²
Two circles: $2 \times \pi \times 5^2 = 50\pi$. Curved surface: $2\pi \times 5 \times 8 = 80\pi$. Total 130π cm².

15. A. 2√3
$\sqrt{75} = 5\sqrt{3}$ and $\sqrt{27} = 3\sqrt{3}$, so the difference is $5\sqrt{3} - 3\sqrt{3} = 2\sqrt{3}$.

16. Answer: C
Comparing the powers of ten first: 10^3 is larger than 10^2 and 10^1, so parcel C at 1100 kg is the heaviest. A is 320 k g and B is 98 kg.

17. B. −1/2
Perpendicular gradients multiply to −1, so the gradient is −1/2.

18. D. a strong negative association
As x increases, y decreases, and the points lie close to a straight line: a strong negative association.

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19. A. $(x - 4)(x - 5)$

Two numbers that multiply to 20 and add to −9 are −4 and −5, so $x^2 - 9x + 20 = (x - 4)(x - 5)$.

20. A. $\sqrt{3}/2$

From the 30-60-90 triangle with sides 1, $\sqrt{3}$ and 2, sin(60°) = opposite ÷ hypotenuse = $\sqrt{3}/2$.

21. A. 2×10^{-6} m

The decimal point moves six places to the right to give 2, and the number is smaller than 1, so the index is negative: 2×10^{-6}. Option D has the right value but the first number must lie between 1 and 10.

22. Answer: 9

The cube root of 27 is 3, and $3^2 = 9$.

23. B. $x \geq -2$

Subtract 3: $-2x \leq 4$. Dividing by −2 reverses the inequality: $x \geq -2$.

24. C. 20 cm²

Area = $\sqrt{50} \times \sqrt{8} = \sqrt{400} = 20$ cm². Alternatively $5\sqrt{2} \times 2\sqrt{2} = 10 \times 2 = 20$.

25. D. The distribution is positively skewed with a possible outlier at 6

The dots bunch at the low end and tail off to the right, which is positive skew, and the lone value at 6 sits well clear of the rest. The mode is 2, which occurs three times.

26. B. $10\sqrt{2}$ cm

$\sqrt{18} = 3\sqrt{2}$ and $\sqrt{8} = 2\sqrt{2}$. The perimeter is $2(3\sqrt{2} + 2\sqrt{2}) = 2 \times 5\sqrt{2} = 10\sqrt{2}$ cm.

27. B. 2/5

Given B means only the 6 + 4 = 10 outcomes in B count. 4 of them are also in A: 4/10 = 2/5.

28. D. approaches zero without ever reaching it

An exponential curve has the x-axis as a horizontal asymptote: 2^x is always positive, so the graph gets ever closer to zero without touching it.

29. C. 41

The interquartile range is 23 − 11 = 12, and 1.5 × 12 = 18. The upper fence is 23 + 18 = 41, so anything above 41 is an outlier. The maximum of 31 is therefore not one.

30. B. 75 km/h

The trip takes 150 ÷ 60 = 2.5 h plus 150 ÷ 100 = 1.5 h, so 4 h for 300 km: 75 km/h. 80 km/h averages the two speeds, which is wrong because more time is spent at the slower speed.

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PREVIEW

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Numeracy — calculator	30	30

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