Maths Year 10 — Practice Exam 1 — Answers & Explanations

Answers to the 30 questions in the free preview.

Numeracy — non-calculator

1. 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 $y = 2x - 3$.

2. A. 29
The interquartile range is Q3 − Q1, so Q3 = 19 + 10 = 29.

3. Answer: 5
$5^2 = 25$ and $6^2 = 36$, so $\sqrt{30}$ lies between 5 and 6. The smaller whole number is 5.

4. Answer: 3
The y-intercept is the value when x = 0, which is 0 − 0 + 3 = 3.

5. Answer: 13
By Pythagoras, the hypotenuse squared is $12^2 + 5^2 = 144 + 25 = 169$, so the hypotenuse is 13 cm.

6. A. x^3
Dividing powers with the same base subtracts the indices: $x^5 \div x^2 = x^{5-2} = x^3$. Option B adds them instead.

7. D. 4.5×10^{-6} kg
Moving the decimal point six places to the right gives 4.5, so the number is 4.5×10^{-6}. Option C has the right value but is not in scientific notation, which needs a number between 1 and 10.

8. Answer: 0.2
For independent events, Pr(A and B) = Pr(A) × Pr(B) = 0.4 × 0.5 = 0.2.

9. B. x = 3 or x = −5
Two numbers multiplying to −15 and adding to 2 are 5 and −3, so $(x + 5)(x - 3) = 0$, giving x = −5 or x = 3.

10. 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.

11. C. Every twentieth name on the full school roll
Taking every twentieth name from the full roll gives every student the same chance of selection. The other three are biased towards early arrivers, musicians, or the kind of student who volunteers.

12. 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 kg and B is 98 kg.

13. B. 12π cm³
$V = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times \pi \times 9 \times 4 = 12\pi$ cm³. 36π cm³ forgets the $\frac{1}{3}$.

14. C. x = 0 or x = 5
$x^2 - 5x = 0$ gives $x(x - 5) = 0$, so x = 0 or x = 5. Dividing both sides by x loses the solution x = 0.

15. A. increase the mean much more than the median
The mean uses every value, so one extreme value pulls it noticeably. The median depends only on position, so it shifts at most one place along the ordered list.

16. D. 45°
The two shorter sides are equal, so the triangle is isosceles and the two non-right angles are equal. They must total 90°, so each is 45°.

17. D. 1/8
A negative index means the reciprocal of the positive power: $2^{-3} = 1 \div 2^3 = 1/8$. A negative index never makes the value itself negative.

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18. Answer: 60
cos θ = adjacent ÷ hypotenuse = 6 ÷ 12 = 1/2, so θ = 60°.

19. B. $6\sqrt{2}$ cm
The side is $\sqrt{72}$. Since $72 = 36 \times 2$, $\sqrt{72} = 6\sqrt{2}$ cm. Option C is equal in value but is not in simplest form.

20. Answer: 18
The triangle has area $\frac{1}{2} \times 2 \times 2 = 2$ cm². Enlarging by 3 multiplies areas by $3^2 = 9$, giving 18 cm².

21. D. 71 °C above air temperature
Substituting t = 3 gives T(3) = 80 − 9 = 71 degrees above the air temperature. Option B subtracts 3 rather than 3^2.

22. A. $1/\sqrt{2}$
cos 45° = adjacent ÷ hypotenuse = $1/\sqrt{2}$ (which is also $\sqrt{2}/2$).

23. B. 2/15
The first draw is red with probability 4/10. After removing one red, the second is red with probability 3/9. Multiplying gives (4/10) × (3/9) = 12/90 = 2/15.

24. 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.

25. B. $x = -1$ and $x = 5$
Setting y = 0 gives $(x - 2)^2 = 9$, so $x - 2 = \pm 3$ and $x = 5$ or $x = -1$.

26. 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.

27. 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.

28. B. $4x^7y^2$
$(2x^3y)^4 = 16x^{12}y^4$. Dividing by $4x^5y^2$ gives $16 \div 4 = 4$, $x^{12} \div x^5 = x^7$ and $y^4 \div y^2 = y^2$, so the result is $4x^7y^2$.

29. Answer: 90
An angle in a semicircle, standing on a diameter, is always a right angle: 90°.

30. C. $r = \sqrt{(A/\pi)}$
Dividing both sides by π gives $r^2 = A/\pi$, then taking the positive square root gives $r = \sqrt{(A/\pi)}$.

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PREVIEW

That’s the end of the preview answers

These are the answers to the 30 preview questions. The full answer key covers all 60 questions in Maths Year 10 — Practice Exam 1, with the working behind every mark.

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