Maths Year 9 — Practice Exam 3 — Answers & Explanations

Answers to the 30 questions in the free preview.

Numeracy — non-calculator

1. Answer: 10

By Pythagoras, $x^2 = 6^2 + 8^2 = 36 + 64 = 100$, so $x = \sqrt{100} = 10$. Adding the sides, 6 + 8 = 14, forgets to square them.

2. C. $y = 3x - 5$

Parallel lines have the same gradient. $y = 3x - 5$ also has gradient 3.

3. B. 2/5

2 of the 5 equal sectors are not red, so the probability is 2/5. 3/5 is the probability that it does land on red, and 2/3 compares not-red with red.

4. B.

$y = x^2$ is a parabola with its lowest point at (0, 0) and $y = 9$ when $x = \pm 3$, as in graph B. Graph C opens downward, and A and D are straight lines.

5. Answer: $77

3 hours pays $66 and half an hour pays $11, so 3.5 hours pays $77.

6. B. 3

The small rectangle is 2 by 1 and the large one is 6 by 3. Each length is 3 times as long, so the scale factor is 3. 4 is the difference in length, not the factor.

7. B. 0.37

It landed point up 74 times out of 200, and 74 ÷ 200 = 0.37. 0.5 would only be right if both results were equally likely, which the results show they are not.

8. Answer: 25

Call the numbers n, n + 1 and n + 2. Then 3n + 3 = 72, so 3n = 69 and n = 23. The numbers are 23, 24 and 25.

9. C. 20

35 ÷ 7 = 5, and 4 × 5 = 20.

10. C. 150 000 000 km

$\times 10^8$ moves the decimal point 8 places to the right: 1.5 becomes 150 000 000. 15 000 000 moves it only 7 places.

11. C. 12.5%

The school grew by 900 − 800 = 100 students. As a percentage of the starting number, 100 ÷ 800 = 0.125 = 12.5%. 11.1% divides by the new number, 900, instead.

12. B. 345 g

Rounding to the nearest 10 g means the true mass could be up to 5 g either side, so it is at least 345 g.

13. Answer: 14

$x^2 = (-2)^2 = 4$, so $2x^2 = 8$, and $-3x = -3 \times (-2) = 6$. 8 + 6 = 14.

14. B. $y = -2x + 3$

The line crosses the y-axis at 3 and falls 2 for every 1 across, so its gradient is −2: $y = -2x + 3$. $y = 2x + 3$ would rise from left to right.

15. D. $\tan^{-1}(1/4)$

The rise is opposite the angle and the horizontal distance is adjacent, so $\tan\theta = 1/4$ and $\theta = \tan^{-1}(1/4)$. The 4 m is not the sloping length, so sine does not apply.

16. Answer: 248

There are two faces of each size: $2 \times (10 \times 6 + 10 \times 4 + 6 \times 4) = 2 \times (60 + 40 + 24) = 248$ cm².

17. A. 2 h 30 min

2100 ÷ 840 = 2.5 hours, which is 2 hours 30 minutes. 2.5 hours is not 2 hours 50 minutes.

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18. B. 5, 12, 13

A triangle is right-angled when the squares of the two shorter sides add to the square of the longest. $5^2 + 12^2 = 25 + 144 = 169 = 13^2$. For 4, 5, 6: 16 + 25 = 41, not 36.

19. Answer: 60

40 minutes is 2/3 of an hour, and 2/3 × 90 = 60 km.

20. Answer: 6

The bases 6 cm and 9 cm match, so the scale factor is 9 ÷ 6 = 1.5. x = 4 × 1.5 = 6. Adding 3 to 4, as 3 was added to 6, gives 7, which is wrong: similar shapes multiply.

21. B. $x^2 - 8x + 16$

$(x - 4)^2 = (x - 4)(x - 4) = x^2 - 4x - 4x + 16 = x^2 - 8x + 16$. Squaring each term separately gives $x^2 + 16$, which is wrong.

22. Answer: $5.44

One pen costs $3.40 ÷ 5 = $0.68, and 8 × $0.68 = $5.44.

23. Answer: −33

$a^3 = (-3)^3 = -27$ and $2a = -6$, so $a^3 + 2a = -33$.

24. B. 3/10

There are 12 + 5 + 8 + 15 = 40 students. 12 play chess only: 12/40 = 3/10. 17/40 includes those who do both.

25. B. 3/10

The first is red with probability 3/5. Then 2 of the 4 marbles left are red: 3/5 × 2/4 = 6/20 = 3/10.

26. A. 16/25

Tennis only is 14 and swimming only is 18, which makes 32 of the 50 students. 32/50 = 16/25. 19/25 = 38/50 wrongly includes the 6 who do both.

27. A. 4

The scales show 5x + 3 = 2x + 15. Take 2x from both sides: 3x + 3 = 15. Take 3 from both sides: 3x = 12, so x = 4. 12 is the value of 3x.

28. C. 7/15

Only the 30 girls count. 14 of them play sport: 14/30 = 7/15. 7/30 divides by all 60 students.

29. Answer: 60 students

Girls have 1 more part than boys, so 1 part is 12 students. The club has 2 + 3 = 5 parts: 5 × 12 = 60 students.

30. D. rotation 90° clockwise about the origin

Each point (x, y) of A moves to (y, −x): (3, 1) goes to (1, −3) and (1, 4) goes to (4, −1). That is a quarter turn clockwise about the origin. A reflection in the x-axis would send (1, 4) to (1, −4).

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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 9 — Practice Exam 3, with the working behind every mark.

STILL TO COME	QUESTIONS	MARKS
Numeracy — calculator	30	30

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