FREE SAMPLE: THE FIRST 3 QUESTIONS

MATHEMATICS — 30 QUESTIONS

Multiple choice · 50 minutes

Work through the questions in order, but do not spend too long on any one. Mark your best answer for every question, then check your work against the worked solutions.

1. In a right-angled triangle the side lengths are 10 cm, 24 cm and 26 cm (hypotenuse). The side opposite angle Q is 24 cm and the side adjacent to angle Q is 10 cm. What is cos Q?

A $\frac{12}{5}$

B $\frac{12}{13}$

C $\frac{13}{5}$

D $\frac{5}{13}$

2. A scatter plot has a plant's age in weeks on the horizontal axis and its height on the vertical axis. The points tend to rise from left to right, with the points close to a straight line. How is the association best described?

A Positive linear association, moderate

B Positive linear association, weak

C Positive linear association, strong

D Negative linear association, strong

3. A line has a gradient of 2 and a y-intercept of −6. What is its equation?

A $y = -6x + 2$

B $y = 2x - 6$

C $y = -2x - 6$

D $y = 2x + 6$

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THE WORKED ANSWERS TO THOSE 3 QUESTIONS

1. In a right-angled triangle the side lengths are 10 cm, 24 cm and 26 cm (hypotenuse). The side opposite angle Q is 24 cm and the side adjacent to angle Q is 10 cm. What is cos Q? [Trigonometric ratios]

Correct answer: D — $\frac{5}{13}$

- sin = opposite ÷ hypotenuse, cos = adjacent ÷ hypotenuse, tan = opposite ÷ adjacent.
- For angle Q: opposite = 24, adjacent = 10, hypotenuse = 26.
- cos Q = $\frac{5}{13}$.
- Why the other options are wrong:
- A ($\frac{12}{5}$): That is the ratio tan for this angle.
- B ($\frac{12}{13}$): That is the ratio sin for this angle.
- C ($\frac{13}{5}$): The ratio was written upside down.

LOS: Stage 5 Trigonometry A

KEY TAKEAWAY
SOH CAH TOA: sin = opp/hyp, cos = adj/hyp, tan = opp/adj.

2. A scatter plot has a plant's age in weeks on the horizontal axis and its height on the vertical axis. The points tend to rise from left to right, with the points close to a straight line. How is the association best described? [Scatter plots]

Correct answer: C — Positive linear association, strong

- Direction: the points rise from left to right (positive).
- Strength: strong, because the points are close to a straight line.
- The association is: Positive linear association, strong.
- Why the other options are wrong:
- A: The strength does not match how closely the points follow a line.
- B: The strength does not match how closely the points follow a line.
- D: The direction of the trend is the other way round.

LOS: Stage 5 Data analysis B

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KEY TAKEAWAY
Describe a scatter plot by its form (linear), direction (positive or negative) and strength.

3. A line has a gradient of 2 and a y-intercept of −6. What is its equation? [Equation of a line]

Correct answer: B — y = 2x − 6

- The equation of a line is y = mx + c, where m is the gradient and c is the y-intercept.
- m = 2 and c = −6.
- y = mx + c gives y = 2x − 6.
- Why the other options are wrong:
- A (y = −6x + 2): The gradient and the y-intercept were swapped.
- C (y = −2x − 6): The sign of the gradient is wrong.
- D (y = 2x + 6): The sign of the y-intercept is wrong.

LOS: MA5-LIN-C-02

KEY TAKEAWAY
In y = mx + c, m is the gradient and c is where the line crosses the y-axis.

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