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. What is the midpoint of the interval joining A(3, −6) and B(11, −14)?

A (8, −8)

B (7, −10)

C (−10, 7)

D (14, −20)

2. Simplify $3m^4 \times 7m^4$.

A $21m^1$

B $10m^8$

C $21m^{16}$

D $21m^8$

3. A scatter plot has the amount of fertiliser used on crops on the horizontal axis and the crop yield (at low amounts) on the vertical axis. The points tend to rise from left to right, with the points fairly spread about a straight line. How is the association best described?

A Positive linear association, weak

B Positive linear association, strong

C Positive linear association, moderate

D Negative linear association, moderate

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THE WORKED ANSWERS TO THOSE 3 QUESTIONS

1. What is the midpoint of the interval joining A(3, −6) and B(11, −14)? [Midpoint]

Correct answer: B — (7, −10)

- Midpoint = (average of the x-values, average of the y-values).
- x: (3 + 11) ÷ 2 = 7. y: (−6 + −14) ÷ 2 = −10.
- Midpoint = (7, −10).
- Why the other options are wrong:
- A ((8, −8)): The coordinates were subtracted instead of averaged.
- C ((−10, 7)): The x and y values were swapped.
- D ((14, −20)): The coordinates were added but not halved.

LOS: MA5-LIN-C-01

> **KEY TAKEAWAY**
> The midpoint is the mean of the x-coordinates and the mean of the y-coordinates.

2. Simplify $3m^4 \times 7m^4$. [Index laws with variables]

Correct answer: D — $21m^8$

- Multiply the numbers: 3 × 7 = 21.
- Add the powers of m: 4 + 4 = 8.
- Answer: $21m^8$.
- Why the other options are wrong:
- A ($21m^1$): The powers were subtracted.
- B ($10m^8$): The numbers were added instead of multiplied.
- C ($21m^{16}$): The powers were multiplied instead of added.

LOS: MA5-IND-C-01

> **KEY TAKEAWAY**
> Multiply the coefficients and add the indices of like variables.

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3. A scatter plot has the amount of fertiliser used on crops on the horizontal axis and the crop yield (at low amounts) on the vertical axis. The points tend to rise from left to right, with the points fairly spread about a straight line. How is the association best described? [Scatter plots]

Correct answer: C — Positive linear association, moderate

- Direction: the points rise from left to right (positive).
- Strength: moderate, because the points are fairly spread about a straight line.
- The association is: Positive linear association, moderate.
- 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

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

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