

1. Walter, Emily, and Ryan are swimmers. Walter swam 12 freestyle laps of the swimming pool and 30 backstroke laps, Emily swam 20 freestyle laps and 20 backstroke laps, and Ryan swam 18 freestyle laps and 20 backstroke laps. Which of the following matrices could represent this information?

A $\begin{bmatrix} 12 & 30 & 20 \\ 20 & 18 & 20 \end{bmatrix}$

B $\begin{bmatrix} 12 & 20 & 18 \\ 30 & 20 & 20 \end{bmatrix}$

C $\begin{bmatrix} 12 & 18 & 30 \\ 20 & 20 & 20 \end{bmatrix}$

D $\begin{bmatrix} 18 & 20 & 12 \\ 30 & 20 & 20 \end{bmatrix}$

2. A survey was done asking students what type of athletic shoes they wear and which type they would buy the next time they bought shoes. The results are shown in the chart below.

| Type Shoe Worn | Type of Shoe Students Would Buy |
|----------------|---|
| Tennis Shoes | 40% Tennis Shoes 25% Running Shoes 35% Basketball Shoes |
| Running Shoes | 60% Running Shoes 15% Tennis Shoes 25% Basketball Shoes |

Which matrix represents these data?

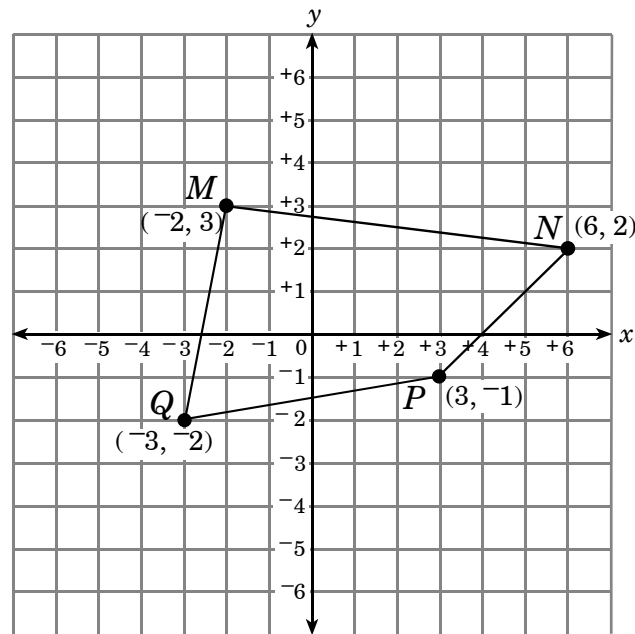
A
$$\begin{matrix} & \mathbf{T} & \mathbf{B} & \mathbf{R} \\ \mathbf{T} & \begin{bmatrix} 40\% & 35\% & 25\% \end{bmatrix} \\ \mathbf{R} & \begin{bmatrix} 15\% & 25\% & 60\% \end{bmatrix} \end{matrix}$$

B
$$\begin{matrix} & \mathbf{T} & \mathbf{B} & \mathbf{R} \\ \mathbf{T} & \begin{bmatrix} 40\% & 25\% & 35\% \end{bmatrix} \\ \mathbf{R} & \begin{bmatrix} 60\% & 15\% & 25\% \end{bmatrix} \end{matrix}$$

C
$$\begin{matrix} & \mathbf{T} & \mathbf{R} \\ \mathbf{T} & \begin{bmatrix} 40\% & 60\% \end{bmatrix} \\ \mathbf{B} & \begin{bmatrix} 25\% & 15\% \end{bmatrix} \\ \mathbf{R} & \begin{bmatrix} 35\% & 25\% \end{bmatrix} \end{matrix}$$

D
$$\begin{matrix} & \mathbf{T} & \mathbf{R} \\ \mathbf{T} & \begin{bmatrix} 40\% & 25\% \end{bmatrix} \\ \mathbf{B} & \begin{bmatrix} 35\% & 60\% \end{bmatrix} \\ \mathbf{R} & \begin{bmatrix} 15\% & 25\% \end{bmatrix} \end{matrix}$$

3. Which matrix correctly displays the coordinates of quadrilateral $MNPQ$?



- A $\begin{bmatrix} -2 & 3 & 3 & -2 \\ 6 & -3 & 2 & -1 \end{bmatrix}$
- B $\begin{bmatrix} -2 & 3 & 6 & 2 \\ 3 & -1 & -3 & -2 \end{bmatrix}$
- C $\begin{bmatrix} -2 & 6 & 3 & -3 \\ 3 & 2 & -1 & -2 \end{bmatrix}$
- D $\begin{bmatrix} 3 & -2 & 2 & 6 \\ -1 & 3 & -2 & -3 \end{bmatrix}$

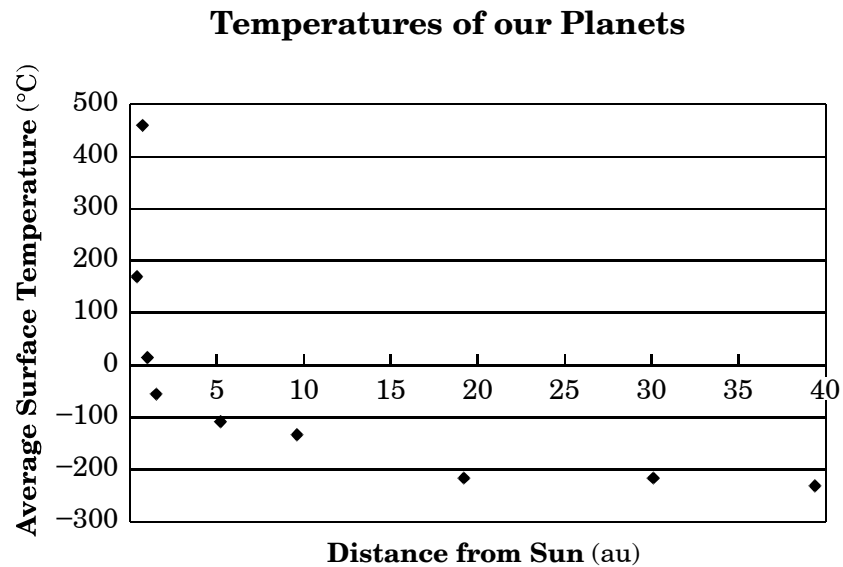
4. The matrix below displays the average SAT scores of eleventh-grade and twelfth-grade students over a three-year period at a high school.

| Carter High School Average SAT Scores | | | |
|--|-------|-------|-------|
| | 1998 | 1999 | 2000 |
| Grade 11 | 976 | 1,035 | 1,100 |
| Grade 12 | 1,028 | 1,164 | 1,253 |

What was the change in average SAT scores of the twelfth graders from 1998 to 2000?

- A Scores increased by 225 points.
- B Scores increased by 89 points.
- C Scores decreased by 225 points.
- D Scores decreased by 89 points.
-
5. Which of the following situations describes a linear relationship?
- A Jeri invested \$2,000 in a savings account that earns 6% interest compounded quarterly.
- B The population of a town decreased from 12,000 to 11,000 in one year and is expected to decrease by 3.5% each year for the next ten years.
- C A ball bounces to one-half its previous height on each bounce.
- D The pathway from the entrance of a cave to the bottom descends at a 5%-grade.

6. The following graph shows the distance from the sun to each planet in the solar system, as measured in astronomical units. Also recorded are the average surface temperatures of each planet, measured in degrees Celsius.



Which of the following **best** describes the relationship between distance and average temperature?

- A linear
- B quadratic
- C absolute value
- D exponential

7. The following data compares the heights and weights of 5 people.

| | height (x) | weight (y) |
|--------|--------------------------|--------------------------|
| Alex | 72 in. | 225 lb |
| Bob | 66 in. | 200 lb |
| Cindy | 60 in. | 105 lb |
| Diane | 62 in. | 120 lb |
| Edward | 84 in. | 400 lb |

Which of the following equations **best** represents this data?

- A $y = 12x - 620$
 B $y = 12x + 620$
 C $y = 5x - 135$
 D $y = 3x + 9$

8. The table contains data about the cost of telephone calls to Sydney, Australia. The long-distance service charges a connection fee plus a certain amount per minute. What is the connection fee charged for each call?

| Time (min) | Cost (ϕ) |
|-------------------|------------------------|
| 1 | 17.9 |
| 5 | 49.5 |
| 8 | 73.2 |
| 11 | 96.9 |
| 20 | 168.0 |

- A 5ϕ
 B 7.9ϕ
 C 10ϕ
 D 17.9ϕ

9. A spring stretches linearly as weight is added. The table shows data collected for a certain spring.

| Weight (g) | Stretch (cm) |
|------------|--------------|
| 100 | 0.5 |
| 500 | 2.5 |
| 800 | 4.0 |
| 900 | 4.5 |
| 1,200 | 6.0 |

What is the slope of the line that fits these data for the spring?

- A $\frac{1}{200}$
- B $\frac{1}{100}$
- C $\frac{1}{50}$
- D $\frac{1}{2}$

End of Goal 4 Sample Items

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Answers to EOC Mathematics Algebra I Sample Items

Goal 4

1. Objective 4.01

Use matrices to display and interpret data.

Thinking Skill: Analyzing **Correct Answer:** B

2. Objective 4.01

Use matrices to display and interpret data.

Thinking Skill: Organizing **Correct Answer:** A

3. Objective 4.01

Use matrices to display and interpret data.

Thinking Skill: Analyzing **Correct Answer:** C

4. Objective 4.01

Use matrices to display and interpret data.

Thinking Skill: Analyzing **Correct Answer:** A

5. Objective 4.02

Recognize and identify linear and non-linear data.

Thinking Skill: Analyzing **Correct Answer:** D

6. Objective 4.02

Recognize and identify linear and non-linear data.

Thinking Skill: Analyzing **Correct Answer:** D

7. Objective 4.03

Create and use linear models based on real data. a) Graph the data. b) Write a linear equation which models a set of real data. c) Describe the slope and intercepts in the context of the data. d) Check the model for goodness-of-fit and use the model to make predictions.

Thinking Skill: Integrating **Correct Answer:** A

8. Objective 4.03

Create and use linear models based on real data. a) Graph the data. b) Write a linear equation which models a set of real data. c) Describe the slope and intercepts in the context of the data. d) Check the model for goodness-of-fit and use the model to make predictions.

Thinking Skill: Integrating **Correct Answer:** C

9. Objective 4.03

Create and use linear models based on real data. a) Graph the data. b) Write a linear equation which models a set of real data. c) Describe the slope and intercepts in the context of the data. d) Check the model for goodness-of-fit and use the model to make predictions.

Thinking Skill: Integrating **Correct Answer:** A