1. Simplify: \((x + 2)(x^2 + 2x + 3)\)
   
   A \(x^3 + 7x + 6\)
   B \(5x^2 + 7x + 6\)
   C \(2x^3 + x^2 + x + 6\)
   D \(x^3 + 4x^2 + 7x + 6\)

2. Which binomial is a factor of \(3x^2 + 2x - 5\)?
   
   A \(3x - 1\)
   B \(x - 1\)
   C \(3x - 5\)
   D \(x - 5\)

3. Simplify: \(\frac{14c^3d^2 - 21c^2d^3}{14cd^2}\)
   
   A \(c^2 - \frac{3cd}{2}\)
   B \(c^2 - \frac{3c^2d}{2}\)
   C \(c^2 - 21c^2d^2\)
   D \(c^2d - \frac{3cd}{2}\)

4. To find the image length, \(L\), of a 4-foot-tall object in a spherical mirror with a focal length of 2 feet, \(L = 4\left(\frac{2}{o - 2}\right)^2\) can be used, where \(o\) is the distance, in feet, of the object from the mirror. What is the image length of the object when it is 1.5 feet away from the mirror?
   
   A 256 feet
   B 128 feet
   C 64 feet
   D 32 feet

5. Which expresses the total surface area (including the top and bottom) of a tower of \(c\) cubes each having side length \(e\)? (do not include faces that cover each other)
   
   A \((4c + 2)e^2\)
   B \(ce^3\)
   C \(6c \cdot e^2\)
   D \(4c \cdot e^2\)
6. The number of bacteria in a culture can be represented by the formula 
\[ N_t = 2.5N_{t-1} \]. In the formula, \( N_t \) is the number of bacteria at the end of \( t \) minutes, and \( N_{t-1} \) is the number of bacteria at the end of \( t - 1 \) minutes. There are 16,406 bacteria in the culture at the end of 7 minutes. How many bacteria will be in the culture at the end of 10 minutes?

A 23,437  
B 102,538  
C 123,045  
D 256,343

7. Suppose that \( y \) varies directly as \( x \), and \( y = 5 \) when \( x = 2 \). What is the value of \( y \) when \( x = 7 \)?

A 2.8  
B 10  
C 17.5  
D 35

8. The distance required for a car to stop is directly proportional to the square of its velocity. If a car can stop in 112.5 meters at 15 kilometers per hour, how many meters are needed to stop at 25 kilometers per hour?

A 250.75  
B 298.00  
C 312.50  
D 337.50

End of Goal 1 Sample Items

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Answers to EOC Mathematics Algebra I Sample Items

Goal 1

1. **Objective 1.01**
   Write equivalent forms of algebraic expressions to solve problems. a) Apply the laws of exponents. b) Operate with polynomials. c) Factor polynomials.
   **Thinking Skill:** Applying  
   **Correct Answer:** D

2. **Objective 1.01**
   Write equivalent forms of algebraic expressions to solve problems. a) Apply the laws of exponents. b) Operate with polynomials. c) Factor polynomials.
   **Thinking Skill:** Applying  
   **Correct Answer:** B

3. **Objective 1.01**
   Write equivalent forms of algebraic expressions to solve problems. a) Apply the laws of exponents. b) Operate with polynomials. c) Factor polynomials.
   **Thinking Skill:** Applying  
   **Correct Answer:** A

4. **Objective 1.02**
   Use formulas and algebraic expressions, including iterative and recursive forms, to model and solve problems.
   **Thinking Skill:** Applying  
   **Correct Answer:** C

5. **Objective 1.02**
   Use formulas and algebraic expressions, including iterative and recursive forms, to model and solve problems.
   **Thinking Skill:** Generating  
   **Correct Answer:** A

6. **Objective 1.02**
   Use formulas and algebraic expressions, including iterative and recursive forms, to model and solve problems.
   **Thinking Skill:** Applying  
   **Correct Answer:** D

7. **Objective 1.03**
   Model and solve problems using direct variation.
   **Thinking Skill:** Applying  
   **Correct Answer:** C

8. **Objective 1.03**
   Model and solve problems using direct variation.
   **Thinking Skill:** Applying  
   **Correct Answer:** C