
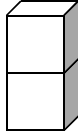
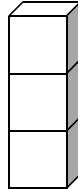


1. Simplify:  $(x + 2)(x^2 + 2x + 3)$
- A  $x^3 + 7x + 6$
- B  $5x^2 + 7x + 6$
- C  $2x^3 + x^2 + x + 6$
- D  $x^3 + 4x^2 + 7x + 6$
2. Which binomial is a factor of  $3x^2 + 2x - 5$ ?
- A  $3x - 1$
- B  $x - 1$
- C  $3x - 5$
- D  $x - 5$
3. Simplify:  $\frac{14c^3d^2 - 21c^2d^3}{14cd^2}$
- A  $c^2 - \frac{3cd}{2}$
- 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)
- 

$c = 1$



$c = 2$



$c = 3$
- A  $(4c + 2)e^2$
- B  $c \cdot e^3$
- 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

*In compliance with federal law, including the provisions of Title IX of the Education Amendments of 1972, the Department of Public Instruction does not discriminate on the basis of race, sex, religion, color, national or ethnic origin, age, disability, or military service in its policies, programs, activities, admissions or employment.*

# 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**

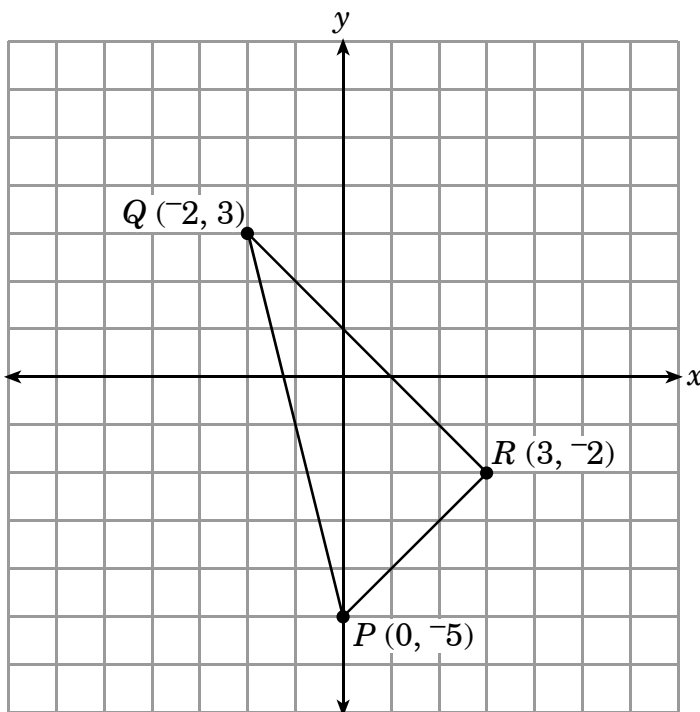
Model and solve problems using direct variation.

**Thinking Skill:** Applying

**Correct Answer:** C

1. On a map's coordinate grid, Panthersville is located at  $(-3, 2)$ , and Heel City is located at  $(4, 8)$ . Falconton is the midpoint between Panthersville and Heel City. What is the **approximate** distance from Panthersville to Falconton? (One map unit equals one mile.)
- A 3.25 miles  
B 4.61 miles  
C 5.00 miles  
D 9.22 miles
- 

2. What is the perimeter of  $\triangle PQR$ ?



- A  $\sqrt{136}$   
B  $10\sqrt{21}$   
C  $2\sqrt{5} + 2\sqrt{3} + 17\sqrt{2}$   
D  $8\sqrt{2} + 2\sqrt{17}$
-

3. Given points  $P(7, 5)$ ,  $Q(8, 3)$ ,  $R(0, -1)$ , and  $S(-1, 1)$ , which statement is true?

- A  $\overrightarrow{PQ}$  is parallel to  $\overrightarrow{RS}$ .
- B  $\overrightarrow{PQ}$  is perpendicular to  $\overrightarrow{RS}$ .
- C  $\overrightarrow{PR}$  is perpendicular to  $\overrightarrow{QS}$ .
- D  $\overrightarrow{PR}$  is parallel to  $\overrightarrow{QS}$ .

4. Which of the following is an equation of the line perpendicular to  $3x + 6y = 12$  and passing through  $(4, 0)$ ?

- A  $y = -\frac{1}{2}x + 2$
- B  $y = \frac{1}{2}x - 2$
- C  $y = -2x + 8$
- D  $y = 2x - 8$

### End of Goal 2 Sample Items

*In compliance with federal law, including the provisions of Title IX of the Education Amendments of 1972, the Department of Public Instruction does not discriminate on the basis of race, sex, religion, color, national or ethnic origin, age, disability, or military service in its policies, programs, activities, admissions or employment.*

## Answers to EOC Mathematics Algebra I Sample Items

### Goal 2

---

**1. Objective 2.01**

Find the lengths and midpoints of segments to solve problems.

**Thinking Skill:** Applying                      **Correct Answer:** B

**2. Objective 2.01**

Find the lengths and midpoints of segments to solve problems.

**Thinking Skill:** Applying                      **Correct Answer:** D

**3. Objective 2.02**

Use the parallelism or perpendicularity of lines and segments to solve problems.

**Thinking Skill:** Applying                      **Correct Answer:** A

**4. Objective 2.02**

Use the parallelism or perpendicularity of lines and segments to solve problems.

**Thinking Skill:** Integrating                      **Correct Answer:** D

1. 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 of Shoe Worn	Type of Shoe Students Would Buy
Tennis Shoes ( <b>T</b> )	40% Tennis Shoes ( <b>T</b> ) 25% Running Shoes ( <b>R</b> ) 35% Basketball Shoes ( <b>B</b> )
Running Shoes ( <b>R</b> )	60% Running Shoes ( <b>R</b> ) 15% Tennis Shoes ( <b>T</b> ) 25% Basketball Shoes ( <b>B</b> )

Which matrix represents these data?

A

	<b>T</b>	<b>B</b>	<b>R</b>
<b>T</b>	40%	35%	25%
<b>R</b>	15%	25%	60%

B

	<b>T</b>	<b>B</b>	<b>R</b>
<b>T</b>	40%	25%	35%
<b>R</b>	60%	15%	25%

C

	<b>T</b>	<b>R</b>
<b>T</b>	40%	60%
<b>B</b>	25%	15%
<b>R</b>	35%	25%

D

	<b>T</b>	<b>R</b>
<b>T</b>	40%	25%
<b>B</b>	35%	60%
<b>R</b>	15%	25%

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

<b>Carter High School Average SAT Scores</b>			
	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.

3. Matrices  $P$  and  $Q$  are shown below.

$$P = \begin{bmatrix} 3 & 2 \\ 6 & 9 \\ 1 & 0 \end{bmatrix} \qquad Q = \begin{bmatrix} -3 & -7 \\ -2 & -6 \\ 4 & 0 \end{bmatrix}$$

What is  $P - Q$ ?

A  $\begin{bmatrix} -6 & -9 \\ -8 & -15 \\ 3 & 0 \end{bmatrix}$

B  $\begin{bmatrix} 0 & -5 \\ 4 & 3 \\ 5 & 0 \end{bmatrix}$

C  $\begin{bmatrix} 0 & 5 \\ -4 & -3 \\ -5 & 0 \end{bmatrix}$

D  $\begin{bmatrix} 6 & 9 \\ 8 & 15 \\ -3 & 0 \end{bmatrix}$

4. Nagel's Bagel Shop makes a monthly report to summarize the cost of making a single bagel of each type and the price at which it is sold. Matrix  $C$  represents cost, and matrix  $P$  represents selling price.

$$C = \begin{matrix} & \text{Plain} & \text{Blueberry} & \text{Wheat} & \text{Onion} \\ \begin{matrix} C = \end{matrix} & [0.12 & 0.17 & 0.13 & 0.15] \end{matrix} \quad P = \begin{matrix} & \text{Plain} & \text{Blueberry} & \text{Wheat} & \text{Onion} \\ \begin{matrix} P = \end{matrix} & [0.45 & 0.50 & 0.50 & 0.50] \end{matrix}$$

Which matrix represents the profit on a single bagel of each type?  
(Profit = Selling Price – Cost)

A  $\begin{matrix} & \text{Plain} & \text{Blueberry} & \text{Wheat} & \text{Onion} \\ \begin{matrix} A \end{matrix} & [0.57 & 0.67 & 0.63 & 0.65] \end{matrix}$

B  $\begin{matrix} & \text{Plain} & \text{Blueberry} & \text{Wheat} & \text{Onion} \\ \begin{matrix} B \end{matrix} & [0.33 & 0.33 & 0.35 & 0.37] \end{matrix}$

C  $\begin{matrix} & \text{Plain} & \text{Blueberry} & \text{Wheat} & \text{Onion} \\ \begin{matrix} C \end{matrix} & [0.33 & 0.33 & 0.33 & 0.33] \end{matrix}$

D  $\begin{matrix} & \text{Plain} & \text{Blueberry} & \text{Wheat} & \text{Onion} \\ \begin{matrix} D \end{matrix} & [0.33 & 0.33 & 0.37 & 0.35] \end{matrix}$

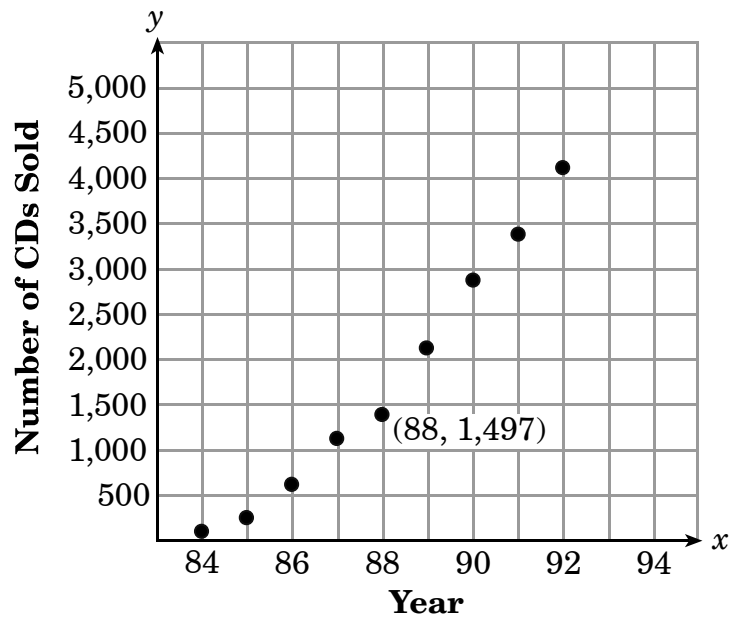
5. The table below shows the number of doctors in Bingham City from 1960 to 1986.

<b>Year</b> ( $x$ )	1960	1967	1970	1975	1982	1985	1986
<b>Number of Doctors</b> ( $y$ )	2,937	3,511	3,754	4,173	4,741	5,019	5,102

If a linear regression model is fit to this data, which equation would **best** represent the data? (let  $x$  = the number of years after 1960)

- A  $y = 1.01x - 3,500$
- B  $y = 82x + 2,937$
- C  $y = 83x + 2,929$
- D  $y = 83x + 2,944$

6. The graph shows a scatterplot of the number of compact discs (CDs) sold at a music store during part of the 1980s and early 1990s. An equation for the line of best fit for the given data is  $y = 518x - 43,886$ .



What is the difference between the observed value and the predicted value at  $x = 88$ ?

- A 1,698
- B 979
- C 518
- D 201

7. The table shows the relationship between calories and fat grams contained in orders of fried chicken from various restaurants.

<b>Calories</b>	305	410	320	500	510	440
<b>Fat Grams</b>	28	34	28	41	42	38

Assuming the data can best be described by a linear model, how many fat grams would be expected to be contained in a 275-calorie order of fried chicken?

- A 28
- B 27
- C 25
- D 22

### End of Goal 3 Sample Items

*In compliance with federal law, including the provisions of Title IX of the Education Amendments of 1972, the Department of Public Instruction does not discriminate on the basis of race, sex, religion, color, national or ethnic origin, age, disability, or military service in its policies, programs, activities, admissions or employment.*

## Answers to EOC Mathematics Algebra I Sample Items

### Goal 3

---

- Objective 3.01**  
Use matrices to display and interpret data.  
**Thinking Skill:** Organizing      **Correct Answer:** A
- Objective 3.01**  
Use matrices to display and interpret data.  
**Thinking Skill:** Applying      **Correct Answer:** A
- Objective 3.02**  
Operate (addition, subtraction, scalar multiplication) with matrices to solve problems.  
**Thinking Skill:** Applying      **Correct Answer:** D
- Objective 3.02**  
Operate (addition, subtraction, scalar multiplication) with matrices to solve problems.  
**Thinking Skill:** Applying      **Correct Answer:** D
- Objective 3.03**  
Create linear models for sets of data to solve problems. a) Interpret constants and coefficients in the context of the data. b) Check the model for goodness-of-fit and use the model, where appropriate, to draw conclusions or make  
**Thinking Skill:** Applying      **Correct Answer:** C
- Objective 3.03**  
Create linear models for sets of data to solve problems. a) Interpret constants and coefficients in the context of the data. b) Check the model for goodness-of-fit and use the model, where appropriate, to draw conclusions or make  
**Thinking Skill:** Analyzing      **Correct Answer:** D
- Objective 3.03**  
Create linear models for sets of data to solve problems. a) Interpret constants and coefficients in the context of the data. b) Check the model for goodness-of-fit and use the model, where appropriate, to draw conclusions or make  
**Thinking Skill:** Analyzing      **Correct Answer:** C

1. Denisha bought a car for \$15,000 and its value depreciated linearly. After 3 years the value was \$11,250. What is the amount of yearly depreciation?
- A \$2,000  
B \$1,500  
C \$1,250  
D \$750
2. In 1994, the average price of a new domestic car was \$16,930. In 2002, the average price was \$19,126. Based on a linear model, what is the predicted average price for 2008?
- A \$22,969  
B \$21,322  
C \$20,773  
D \$18,577
3. If the graph of a line has a positive slope and a negative  $y$ -intercept, what happens to the  $x$ -intercept if the slope and the  $y$ -intercept are doubled?
- A The  $x$ -intercept becomes four times larger.  
B The  $x$ -intercept becomes twice as large.  
C The  $x$ -intercept becomes one-fourth as large.  
D The  $x$ -intercept remains the same.
4. An object is fired upward at an initial velocity,  $v_0$ , of 240 ft/s. The height,  $h(t)$ , of the object is a function of time,  $t$ , in seconds and is given by the formula  $h(t) = v_0t - 16t^2$ . How long will it take the object to hit the ground after takeoff?
- A 16 seconds  
B 15 seconds  
C 7.5 seconds  
D 4 seconds
5. Given  $f(x) = -3x^2 + 5$ , what is the range of the function?
- A all real numbers less than or equal to 5  
B all integers less than or equal to 5  
C all nonnegative real numbers  
D all nonnegative integers

6. A store received \$823 from the sale of 5 tape recorders and 7 radios. If the receipts from the tape recorders exceeded the receipts from the radios by \$137, what is the price of a tape recorder?

A \$49  
B \$68  
C \$84  
D \$96

7. A region is defined by this system:

$$\begin{aligned}y &> 2x + 1 \\y &\leq -x - 2\end{aligned}$$

In which quadrants of the coordinate plane is the region located?

A I, II, III only  
B II, III only  
C III, IV only  
D I, II, III, IV

8. When Robert was born, his grandfather invested \$1,000 for his college education. At an interest rate of 4.5%, compounded annually, **approximately** how much would Robert have at age 18? (use the formula  $A = P(1 + r)^t$ , where  $P$  is the principal,  $r$  is the interest rate, and  $t$  is the time in years)

A \$1,810  
B \$2,200  
C \$3,680  
D \$18,810

9. A new automobile is purchased for \$20,000. If  $V = 20,000(0.8)^x$  gives the car's value after  $x$  years, **about** how long will it take for the car to be worth half its purchase price?
- A 3 years
- B 4 years
- C 5 years
- D 6 years

### End of Goal 4 Sample Items

*In compliance with federal law, including the provisions of Title IX of the Education Amendments of 1972, the Department of Public Instruction does not discriminate on the basis of race, sex, religion, color, national or ethnic origin, age, disability, or military service in its policies, programs, activities, admissions or employment.*

## Answers to EOC Mathematics Algebra I Sample Items

### Goal 4

---

**1. Objective 4.01**

Use linear functions or inequalities to model and solve problems; justify results. a) Solve using tables, graphs, and algebraic properties. b) Interpret constants and coefficients in the context of the problem.

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

**2. Objective 4.01**

Use linear functions or inequalities to model and solve problems; justify results. a) Solve using tables, graphs, and algebraic properties. b) Interpret constants and coefficients in the context of the problem.

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

**3. Objective 4.01**

Use linear functions or inequalities to model and solve problems; justify results. a) Solve using tables, graphs, and algebraic properties. b) Interpret constants and coefficients in the context of the problem.

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

**4. Objective 4.02**

Graph, factor, and evaluate quadratic functions to solve problems.

**Thinking Skill:** Applying                      **Correct Answer:** B

**5. Objective 4.02**

Graph, factor, and evaluate quadratic functions to solve problems.

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

**6. Objective 4.03**

Use systems of linear equations or inequalities in two variables to model and solve problems. Solve using tables, graphs, and algebraic properties; justify results.

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

**7. Objective 4.03**

Use systems of linear equations or inequalities in two variables to model and solve problems. Solve using tables, graphs, and algebraic properties; justify results.

**Thinking Skill:** Applying                      **Correct Answer:** B

**8. Objective 4.04**

Graph and evaluate exponential functions to solve problems.

**Thinking Skill:** Applying                      **Correct Answer:** B

## Answers to EOC Mathematics Algebra I Sample Items

### Goal 4

---

**9. Objective 4.04**

Graph and evaluate exponential functions to solve problems.

**Thinking Skill:** Applying

**Correct Answer:** A