

VIRGINIA STANDARDS OF LEARNING

EOC
ALGEBRA 1

2023 Mathematics Standards of Learning

Practice Item Set

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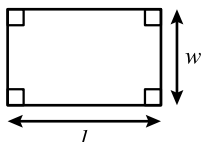
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Algebra 1 Formula Sheet

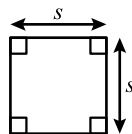
2023 Mathematics Standards of Learning

Geometric Formulas:



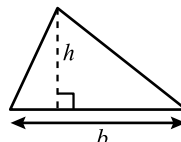
$$p = 2l + 2w$$

$$A = lw$$

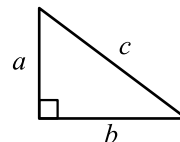


$$p = 4s$$

$$A = s^2$$



$$A = \frac{1}{2}bh$$



$$a^2 + b^2 = c^2$$

Quadratic Formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}, \text{ where } ax^2 + bx + c = 0 \text{ and } a \neq 0$$

- 1** What is the value of this expression when $a = 8$, $b = 16$, and $c = -4$?

$$5\sqrt[3]{a} - c\sqrt{b} + 9$$

- A** 30
- B** 35
- C** 50
- D** 51

- 2** What is the quotient of $(15x^2 - 8x - 12)$ and $(3x + 2)$? Assume the denominator does not equal zero.

- F** $45x^3 + 6x^2 - 52x - 24$
- G** $15x^2 - 5x - 10$
- H** $5x + 6$
- J** $5x - 6$

3 Which represents this expression in simplest form?

$$\frac{15(x^{-2})^3}{3(x^{-4})^{-3}}$$

A $\frac{12}{x^6}$

B $12x^{18}$

C $\frac{5}{x^6}$

D $\frac{5}{x^{18}}$

4 For which value of x does $\sqrt[3]{x}$ simplify to $5\sqrt[3]{7}$?

F 35

G 245

H 875

J 1715

5 What is $\sqrt[3]{3,456}$ in simplest form?

A $2\sqrt[3]{12}$

B $6\sqrt[3]{16}$

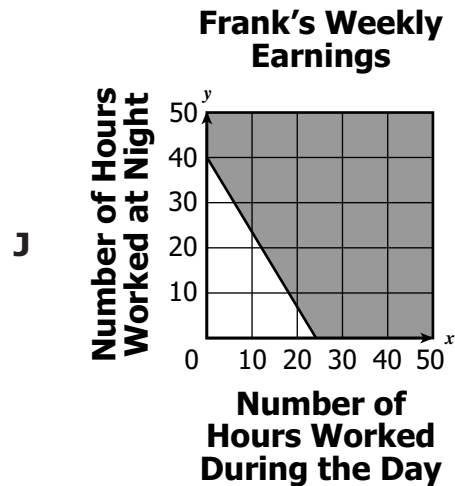
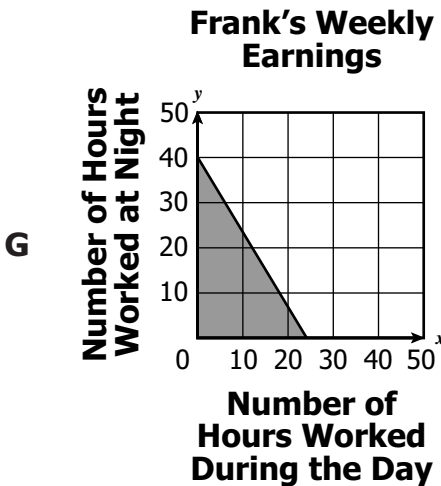
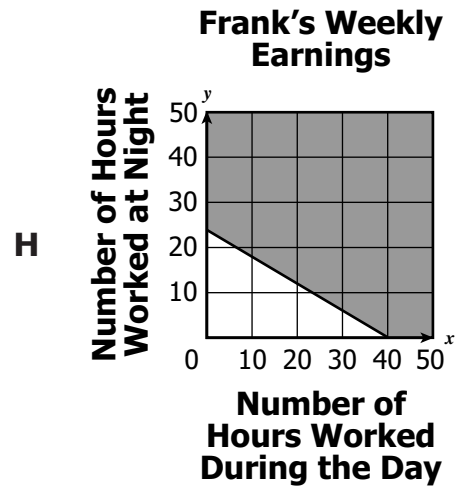
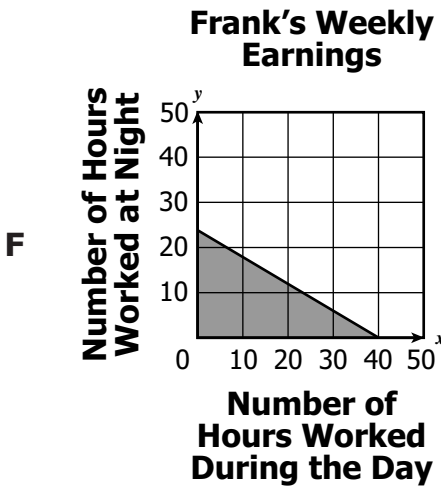
C $12\sqrt[3]{2}$

D $24\sqrt[3]{6}$

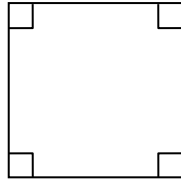
6 Frank works at a convenience store.

- He earns \$7.50 per hour when he works during the day.
- He earns \$12.50 per hour when he works at night.
- He wants to earn at least \$300 per week.

Which graph best represents this situation?



7 A square with a side length of x inches is shown.



x in.

The equation $y = 4x$ represents the relationship between the side length, x , and the perimeter, y , of the square in inches. Which student states the correct domain and range of this relationship?

- A** Juan says the domain is all integers, and the range is all integers.
- B** Stacy says the domain is all positive integers, and the range is all positive integers.
- C** George says the domain is all negative numbers, and the range is all negative numbers.
- D** Marla says the domain is all positive real numbers, and the range is all positive real numbers.

8 A function f is described.

- $f(x) = (x - 2)^2 + 3$
- The domain of f is all real numbers greater than 0.

The range of f is all real numbers greater than or equal to —

- F** 2
- G** 3
- H** 5
- J** 7

9 Which function does NOT have a y -intercept of 2 ?

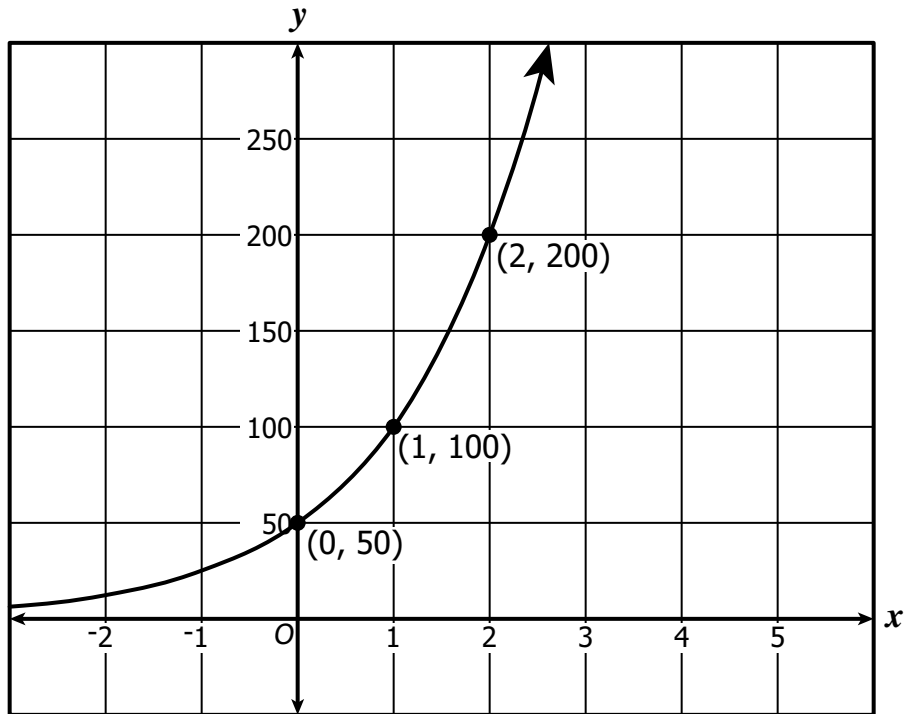
A $y = \frac{x + 10}{5}$

B $y = 4(x + 0.5)$

C $y = x^2 + 7x + 2$

D $y = (x - 2)(x + 5)$

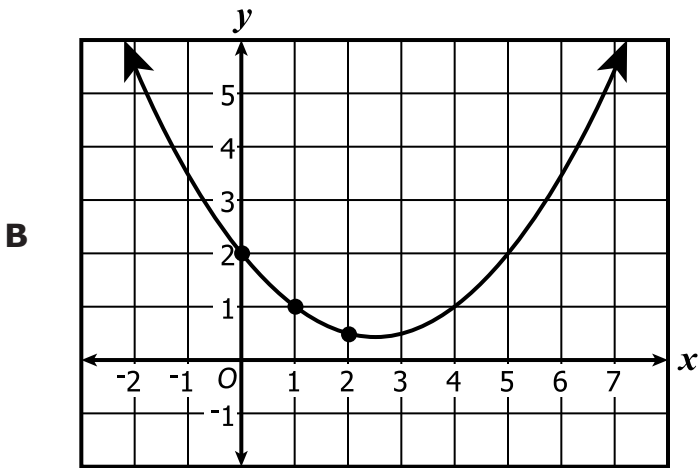
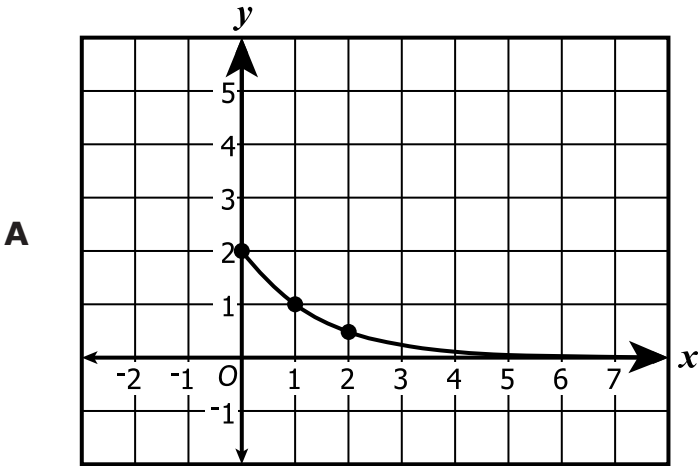
10 The graph of the function $f(x)$ is shown on the coordinate plane.



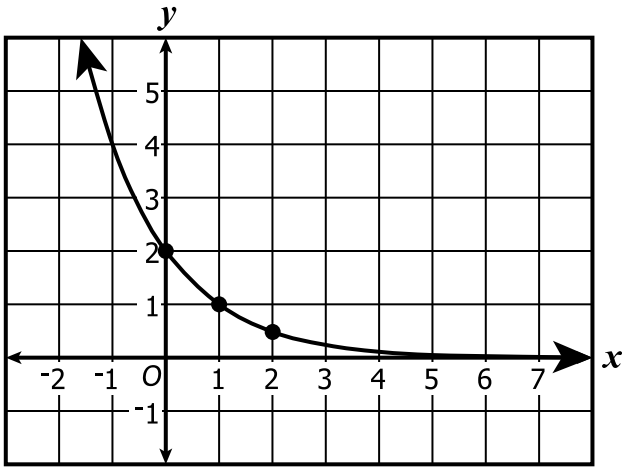
Which of these points is a solution of $y = 3f(x)$?

- F (0, 300)
- G (1, 300)
- H (3, 300)
- J (6, 200)

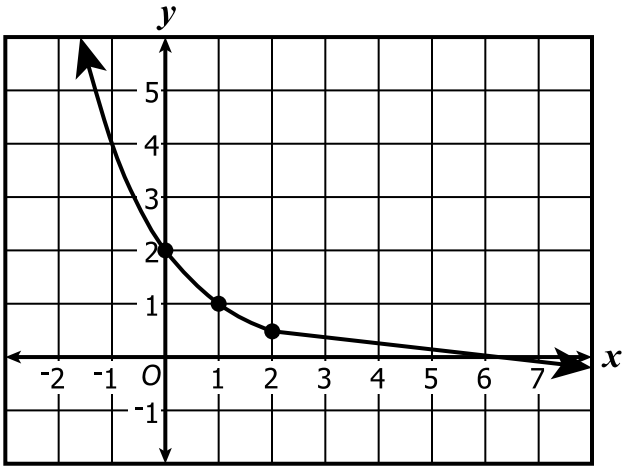
11 The graph of an exponential function in the form $y = ab^x$ contains the points $(0, 2)$, $(1, 1)$, and $(2, \frac{1}{2})$. Which graph best represents the function?



C



D



12 Which table represents $y = (x + 5)^2$?

F

x	y
3	28
4	29

H

x	y
3	64
4	81

G

x	y
3	14
4	21

J

x	y
3	34
4	41

13 Each table represents values from four different functions.

Table 1

x	y
1	10
2	100
3	1,000
4	10,000

Table 2

x	y
1	100
2	400
3	900
4	1,600

Table 3

x	y
1	2,000
2	1,500
3	1,000
4	500

Table 4

x	y
1	5,000
2	2,500
3	1,250
4	625

Which tables could represent an exponential function?

- A** Table 1 and Table 2
- B** Table 1 and Table 4
- C** Table 2 and Table 4
- D** Table 3 and Table 4

14 Given:

$$f(x) = -x + 5$$

$$g(x) = 2x - 5$$

$$h(x) = (x + 2)(x - 5)$$

Which functions have at least one equivalent x -intercept?

- F** $f(x)$ and $g(x)$ only
- G** $f(x)$ and $h(x)$ only
- H** $g(x)$ and $h(x)$ only
- J** $f(x)$, $g(x)$, and $h(x)$

Directions: Use the following information to answer questions 15–16.

The principal at Washington High School investigated the relationship between a student’s cell phone use and the student’s grade point average, GPA. The table shows a sample of the data collected by the principal.

Student Cell Phone Use and Grade Point Average, GPA

Average Number of Hours per Day	1	2	2.5	3	3.5	4	4.5	6	6	6.5	7	7.5	8	8.5
GPA	3.8	3.6	3.7	3.4	3.2	3.2	3.1	2.6	2.7	2.6	2.4	2.2	2.1	2.0

15 The correlation coefficient for the curve of best fit is -0.9921 . Based on the data, there appears to be —

- A** no relationship
- B** a weak relationship
- C** a strong relationship
- D** a positive relationship

16 Which conclusion about the relationship between student cell phone use and GPA is best supported by these data?

- F** Increased cell phone use prevents students from getting good grades.
- G** Decreased cell phone use causes students to perform better in school.
- H** The more time students spend on their cell phones, the lower their GPA.
- J** There is no relationship between student cell phone use and the student's GPA.

End of Set

17 Using the quadratic curve of best fit, which equation most closely represents the set of data?

$\{ (-8, 80.4), (-7, 57.8), (-6, 38.6), (-5, 22.8), (3, 18.8), (5, 51.8), (7, 98.4) \}$

- A** $y = x^2 + 2x - 5$
- B** $y = x^2 - 3x + 5.2$
- C** $y = 1.7x^2 - 3x + 5$
- D** $y = 1.7x^2 + 2.9x - 5.2$

18 This table shows the number of months used and the approximate distances driven, in miles, for six buses in a school district.

Buses

Bus	Months Used	Distances Driven (miles)
Bus A	6	10,100
Bus B	10	17,000
Bus C	12	23,900
Bus D	15	31,500
Bus E	20	43,200
Bus F	27	59,900

Using the line of best fit for these data, which value is the best prediction of the distance driven, in miles, by a bus that has been used for 40 months?

- F** 68,000
- G** 79,100
- H** 86,400
- J** 91,400

**EOC Algebra 1
Practice Item Set Spring 2025
Answer Key**

Sequence Number	Correct Answer	Reporting Category	Reporting Category Description
1	B	001	Expressions and Operations
2	J	001	Expressions and Operations
3	D	001	Expressions and Operations
4	H	001	Expressions and Operations
5	C	001	Expressions and Operations
6	H	002	Equations and Inequalities
7	D	003	Functions and Statistics
8	G	003	Functions and Statistics
9	D	003	Functions and Statistics
10	G	003	Functions and Statistics
11	C	003	Functions and Statistics
12	H	003	Functions and Statistics
13	B	003	Functions and Statistics
14	G	003	Functions and Statistics
15	C	003	Functions and Statistics
16	H	003	Functions and Statistics
17	D	003	Functions and Statistics
18	J	003	Functions and Statistics

