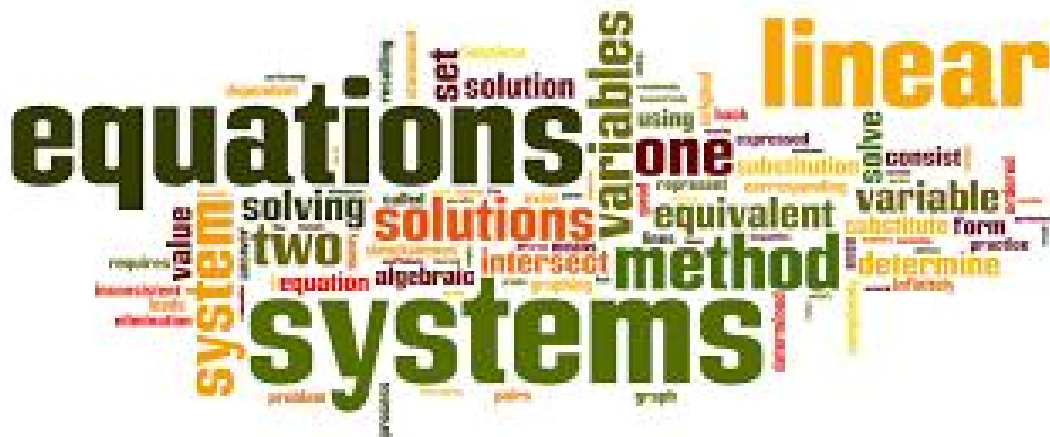


# EOC FSA Practice Test

# Algebra 1

## No Calculator Portion



## Algebra 1 EOC FSA Mathematics Reference Sheet

### Customary Conversions

1 foot = 12 inches  
1 yard = 3 feet  
1 mile = 5,280 feet  
1 mile = 1,760 yards

1 cup = 8 fluid ounces  
1 pint = 2 cups  
1 quart = 2 pints  
1 gallon = 4 quarts

1 pound = 16 ounces  
1 ton = 2,000 pounds

### Metric Conversions

1 meter = 100 centimeters  
1 meter = 1000 millimeters  
1 kilometer = 1000 meters

1 liter = 1000 milliliters

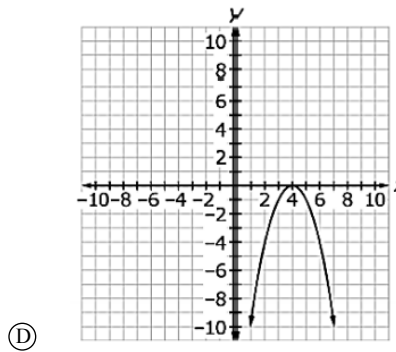
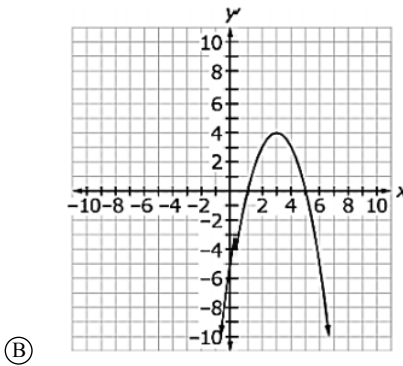
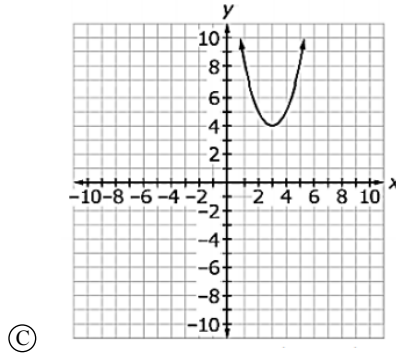
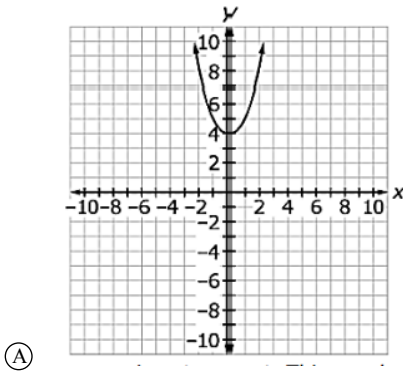
1 gram = 1000 milligrams  
1 kilogram = 1000 grams

### Time Conversions

1 minute = 60 seconds  
1 hour = 60 minutes  
1 day = 24 hours  
1 year = 365 days  
1 year = 52 weeks

**Algebra 1 EOC FSA Practice Test (No Calculator Portion)**

**1** Which graph changes from increasing to decreasing after  $y = 4$ ?



**2** Let  $u = x^2 + 3$ . Which equation is equivalent to  $(x^2 + 3)^2 + 21 = 10x^2 + 30$  in terms of  $u$ ?

- (A)  $u^2 + 10u + 51 = 0$
- (B)  $u^2 - 10u + 51 = 0$
- (C)  $u^2 + 10u + 21 = 0$
- (D)  $u^2 - 10u + 21 = 0$

**3** A Ball was thrown upward into the air. The height, in feet of the ball above the ground  $t$  seconds after being thrown can be determined by the expression  $-16t^2 + 40t + 3$ . What is the meaning of the **3** in the expression? Select the correct answer.

- (A) The ball takes 3 seconds to reach its maximum height.
- (B) The ball takes 3 seconds to reach the ground.
- (C) The ball was thrown from a height of 3 feet.
- (D) The ball reaches a maximum height of 3 feet.

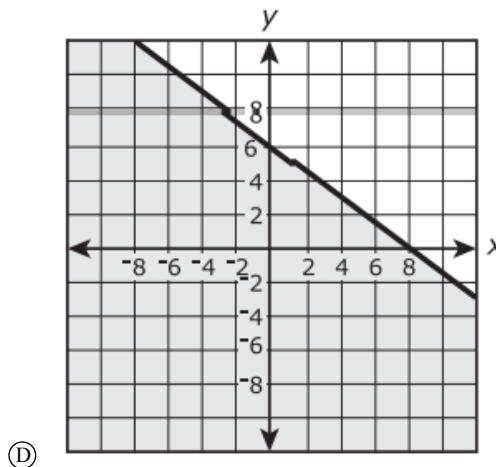
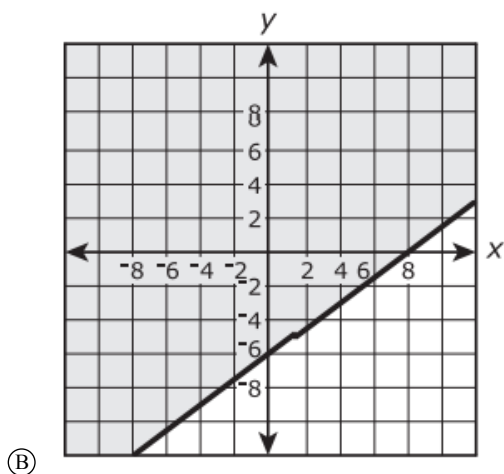
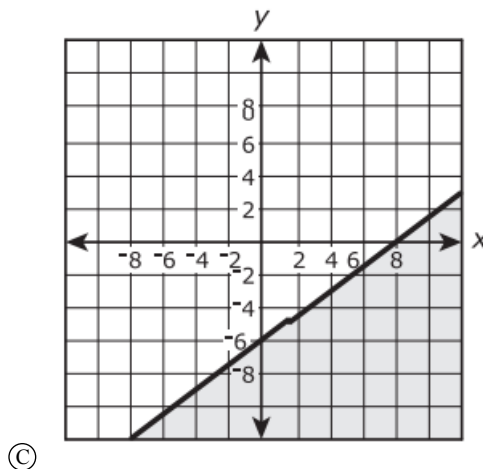
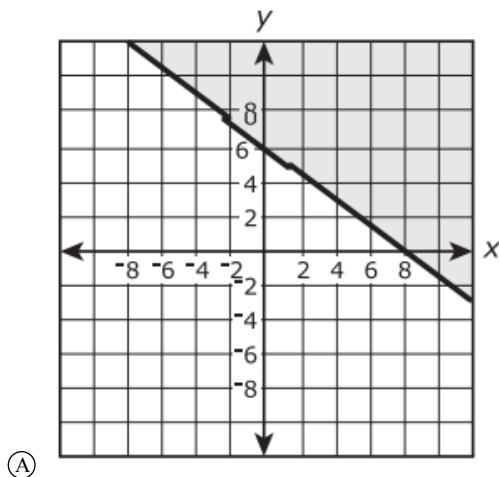
4 The cost to manufacture  $x$  pairs of sunglasses can be represented by a function  $C(x)$ . If it costs \$398 to manufacture 4 pairs of sunglasses, which of the following is true? Select the correct equation.

- (A)  $C(4) = 99.50$
- (B)  $C(398) = 4$
- (C)  $C(4) = 398$
- (D)  $C(99.50) = 1$

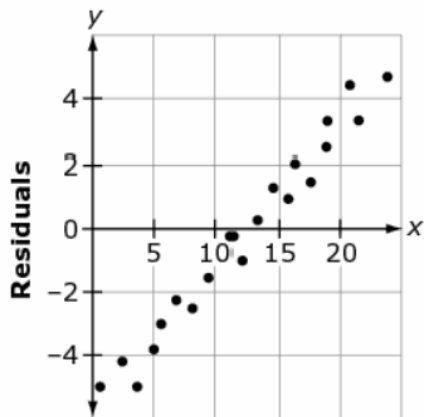
5 A student creates a function to represent the cost of pencils available for purchase at the school store. The school charges 5 cents per pencil for up to 20 pencils. What is the domain of the function?

- (A) all integers from 0 to 20
- (B) all real numbers from 0 to 20
- (C) all integer multiples of 5 from 5 to 100
- (D) all real number multiples of 5 from 5 to 100

6 Which is a graph of the solution set of the inequality  $3x - 4y \leq 24$  ?



- 7 A residual plot is shown.



Does this residual plot suggest a good fit for the line used to generate the residuals? Why?

- (A) Yes. The residuals show a strong linear trend.
- (B) No. The data would be better modeled by a quadratic function.
- (C) Yes. There is an equal number of points above and below the x-axis.
- (D) No. The presence of a pattern in the residuals suggests a poor fit for this line.

- 8 A manufacturer compares its income,  $f(x)$ , to its expenses,  $g(x)$ , for  $x$  number of units sold.

What does the solution to  $f(x) = g(x)$  represent for the manufacturer?

- (A) the number of units sold when the manufacturer had an overall loss for the year
- (B) the number of units sold when the manufacturer had an overall profit for the year
- (C) the number of units sold when the manufacturer's income equaled the manufacturer's expenses
- (D) the number of units sold when the manufacturer's income and expenses were both positive values

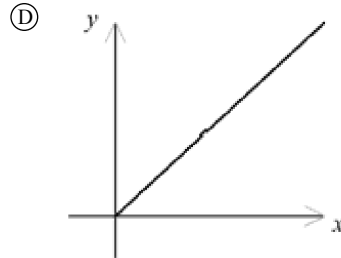
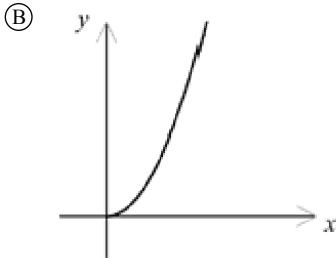
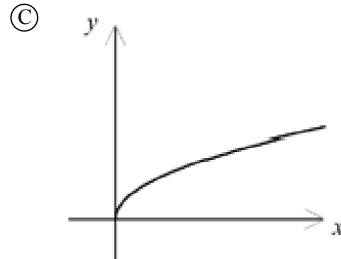
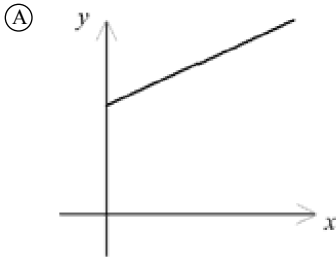
- 9 Celia is solving the equation  $7x + 3(x - 2) = 14$ .

Her first step is shown as  $7x + 3x - 6 = 14$ .

Which statement best describes Celia's work in her first step?

- (A) She combined the terms 3 and  $x$ .
- (B) She distributed 3 to the terms in the parentheses.
- (C) She combined like terms by adding them together.
- (D) She removed parentheses in order to isolate the variable.

- 10** A salesperson earns a monthly salary of \$500 a month plus a percentage of the proceeds from the number of items he sells. Which graph could be a model of this situation?



- 11** Write the expression  $\sqrt[11]{10^8}$  by using rational exponents.

(A)  $10^{\frac{8}{11}}$

(C)  $10^{-3}$

(B)  $10^3$

(D)  $10^{\frac{11}{8}}$

- 12** An expression is shown.

$$a^{\frac{1}{5}} \cdot a^{\frac{3}{4}}$$

What is the product of the two factors?

(A)  $a^{\frac{3}{4}}$

(B)  $a^{\frac{3}{20}}$

(C)  $a^{\frac{1}{3}}$

(D)  $a^{\frac{4}{9}}$

- 13** In the equations listed  $a$ ,  $b$ ,  $c$ , and  $d$  are real numbers. Which of the equations could have solutions that are nonreal?

Select **all** that apply.

- (A)  $ax^2 = b$
- (B)  $ax^2 + bx = 0$
- (C)  $ax^2 + bx + c = 0$
- (D)  $(ax + b)(cx + d) = 0$
- (E)  $a(bx + c)^2 = d$

- 14** Select all the numbers that could be the sum of a rational number and an irrational number.

- (A)  $4.076923076923$
- (B)  $5.236067977567\dots$
- (C)  $3.116666666666\overline{6}$
- (D)  $9.605555127513\dots$
- (E)  $6.714285714285$
- (F)  $2.718281828582\dots$

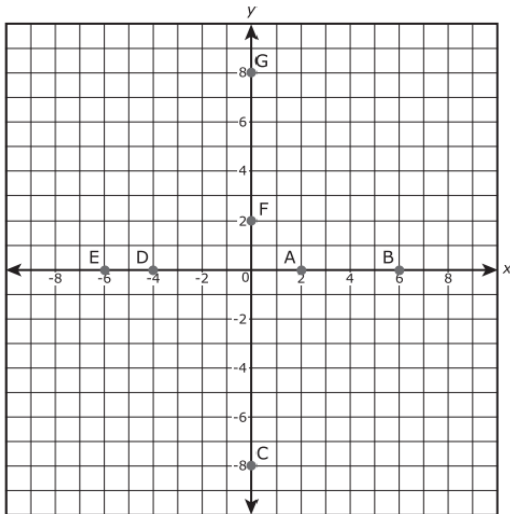
- 15** Which of the following do not have integer exponents when rewritten in rational exponent form and simplified? Assume that  $s$  is nonnegative.

- (A)  $\sqrt{s^4}$
- (B)  $\sqrt[6]{s^3}$
- (C)  $\sqrt[4]{s^6}$
- (D)  $\sqrt[3]{s^9}$
- (E)  $\sqrt[5]{s^{15}}$
- (F)  $\sqrt[8]{s^2}$

- 16** Sal is having a yard sale. He plans to sell his old DVDs and CDs. Combined, he has 75 DVDs and CDs. He prices them at \$1.50 per CD and \$4.50 per DVD. Let  $d$  represent the number of DVDs Sal sells and  $c$  represent the number of CDs Sal sells. He sells all of his DVDs and CDs and earns \$262.50. Which of the following equations should be included in a system that reflects the constraints of this situation?

- (A)  $1.5c + 4.5d = 75$
- (B)  $c + d = 75$
- (C)  $1.5c = 262.50$
- (D)  $4.5d = 262.50$
- (E)  $1.5c + 4.5d = 262.50$

- 17 Several points are plotted on the graph.



Which of the plotted points on the graph represent the zeros of the function  $f(x) = (x^2 + 2x - 8)(x - 6)$ ?

Select **all** that apply.

- Ⓐ (2, 0)
  - Ⓑ (6, 0)
  - Ⓒ (0, -8)
  - Ⓓ (-4, 0)
  - Ⓔ (-6, 0)
  - Ⓕ (0, 2)
  - Ⓖ (0, 8)
- 18 Marco starts reading a 350-page book at 9 a.m. The number of pages  $P$  Marco has left to read  $t$  hours after 9 a.m. is modeled by the function  $P(t) = 350 - 45t$ . During which of the following time periods does Marco read the same number of pages he reads between 11 a.m. and 1 p.m.?
- Ⓐ 9 a.m. to 11 a.m.
  - Ⓑ 11 a.m. to 12 noon
  - Ⓒ 12:30 p.m. to 1:30 p.m.
  - Ⓓ 2 p.m. to 4 p.m.
  - Ⓔ 1:30 p.m. to 3:30 p.m.



- 19 The figure shows a graph of the function  $f(x)$  in the  $xy$ -coordinate plane, with the vertex at  $(1, 9)$  and the zeros at  $-2$  and  $4$ .

The function  $g$  is defined by  $g(x) = -3x + 2$ .

Which statements are true? Select **all** that apply.

- (A)  $f(-2)$  is greater than  $g(-2)$ .  
(B)  $f(-1)$  is greater than  $g(0)$ .  
(C)  $f(0)$  is greater than  $g(0)$ .  
(D)  $f(1)$  is less than  $g(1)$ .  
(E)  $f(2)$  is greater than  $g(2)$ .
- 20 The students in a science class constructed bridges made from toothpicks and glue. Each bridge was made following these rules:

Each bridge used the same number of toothpicks.

The width of each bridge was the same.

The length of each bridge could vary.

Students recorded the maximum number of pennies each bridge could hold in a cup hanging from the center of the bridge before breaking. They called this number the breaking weight.

The function  $f(x) = -6x + 136$  represents the breaking weight of the pennies,  $f(x)$ , in terms of bridge length,  $x$ .

What is the change of the breaking weight of the pennies for each increase in one unit of the length of the bridge?

←	→	↶	↷	✖
1	2	3		
4	5	6		
7	8	9		
0	.	-		

21 A quadratic function is shown.

$$f(x) = -x^2 + 7x - 12$$

One factor is  $(x - 4)$ .

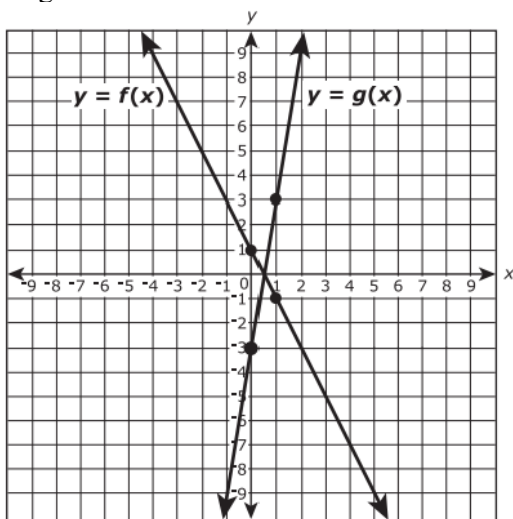
What is the other factor of the quadratic equation?

<span>←</span> <span>→</span> <span>↶</span> <span>↷</span> <span>✖</span>											
1	2	3	$f(x)$	$x$							
4	5	6	+	-	*	/					
7	8	9	<	≤	=	≥	>				
0	.	-	$\frac{\square}{\square}$	$\square^\square$	$\square_\square$	( )		$\sqrt{\square}$	$\sqrt[\square]{\square}$	$\pi$	$i$

22 Rewrite the expression  $-3a(a + b - 5) + 4(-2a + 2b) + b(a + 3b - 7)$  to find the coefficients of each item. Enter the coefficients into the appropriate boxes.

	$a^2$	+		$b^2$	+		$ab$	+		$a$	+		$b$
--	-------	---	--	-------	---	--	------	---	--	-----	---	--	-----

23 The figure shows the graphs of the functions  $y = f(x)$  and  $y = g(x)$ . The four indicated points all have integer coordinates.



If  $g(x) = k \cdot f(x)$ , what is the value of  $k$ ? Enter your answer in the box.

24 Consider the equation  $a^b = b$ , where a and b are different numbers.

- What is the value of  $a$ ? Enter your answer on the first line.
- What is the value of  $b$ ? Enter your answer on the second line.

← → ↶ ↷ ✖

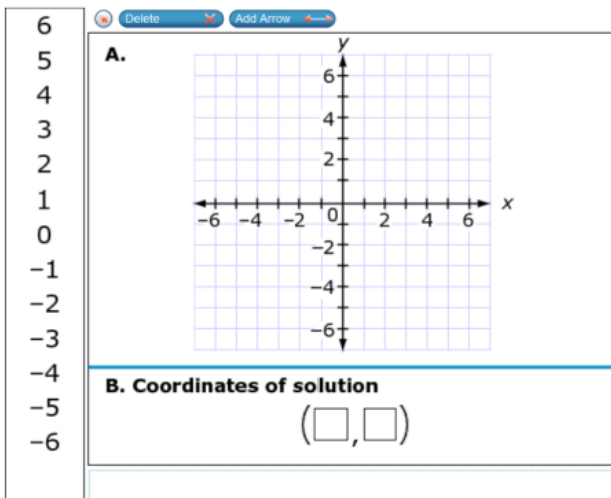
1	2	3
4	5	6
7	8	9
0	.	-

25 A system of equations is shown.

$$y = x + 2$$

$$y = -2x - 1$$

- A. Graph the two equations.
- B. What is the solution to the system of equations?  
Write numbers in the boxes to show the solution.



Name: \_\_\_\_\_

ID: A

**26** Rewrite the function  $f(x) = 2x^2 - 8x + 9$  in vertex form by completing the square.

Enter your answers in the boxes.

$$f(x) = \boxed{\phantom{000}} (x - \boxed{\phantom{000}})^2 + \boxed{\phantom{000}}$$

Therefore,  $f(x) = 2x^2 - 8x + 9$  has a minimum value of

**27** An equation is shown.

$$a \times b = c$$

Let  $c$  be an irrational number.

What can be said about  $a$  and  $b$ ?

Place your answer in the space provided.

28 Two functions are shown.

$x$	$f(x)$
0	0
3	1
6	2
9	3

$$g(x) = \frac{1}{2}x + 3$$

**Part A**

Graph  $f(x)$  and  $g(x)$

**Part B**

Record the function with the greater rate of change in the box

$f(x)$ 
Delete
Add Point
Add Arrow

$f(x)$

$g(x)$

**A. Graph  $f(x)$  and  $g(x)$**

---

**B. Function With Greater Rate of Change**

29 An inequality is shown.

$$5 - 7x < 33$$

Place an arrow onto the number line to show the correct solution to the inequality.

**Graph solution**

**30** The product of two numbers is 323 and the difference between them is 2.

What are the two numbers?

Enter each number on a separate line.

← → ↶ ↷ ✖

1	2	3	+	-	•	÷
4	5	6	<	≤	≥	>
7	8	9	$\frac{\square}{\square}$	$\square^\square$	$\square^\square$	$\pi$
0	.	-				

**31** The function for the profit,  $p$ , from selling glasses of lemonade,  $L$ , is shown.

$$p = 2L - 26$$

**Part A**

Write numbers into the boxes to complete the table. Choose a positive or negative sign to complete the number

**Part B**

Put numbers into the box to show the minimum number of glasses that need to be sold to make a profit.

0			Delete
1	<b>A.</b>	<b>Input</b>	<b>Output</b>
2		5	○ <input style="width: 40px;" type="text"/>
3			+ <input style="width: 40px;" type="text"/>
4			- <input style="width: 40px;" type="text"/>
5		10	○ <input style="width: 40px;" type="text"/>
6			+ <input style="width: 40px;" type="text"/>
7			- <input style="width: 40px;" type="text"/>
8		15	○ <input style="width: 40px;" type="text"/>
9			+ <input style="width: 40px;" type="text"/>
			- <input style="width: 40px;" type="text"/>
	<b>B.</b>	<input style="width: 60px;" type="text"/> glasses	

- 32** Solve the equation shown.

$$x^2 + 4x = 12$$

Enter each solution on a separate line.

← → ↶ ↷ ✕											
1	2	3	x								
4	5	6	+	-	*	÷					
7	8	9	<	≤	=	≥	>				
0	.	-	$\frac{\square}{\square}$	$\square^\square$	$\square_\square$	( )		$\sqrt{\square}$	$\sqrt[n]{\square}$	$\pi$	$i$

- 33** The students in a high school environmental club are trying to raise community awareness of a recycling program for old cell phones. Janine, a member of the club, created a website that members of the community can view to get more information about the program. The number of times that the website is viewed each day is recorded as a hit. On day 1, the website received 2 hits, and on day 3 the website received 8 hits.

**Part A**

Based on the data from days 1 and 3, Janine claims that the number of hits,  $h$  on day  $d$  can be modeled by an exponential function. What is the number of hits predicted on day 6 by an exponential model?

Enter your answer in the box.

**Part B**

Raul is also a member of the environmental club. He disagrees with Janine and claims that the number of hits each can be modeled by a linear function.

Select from the drop-down menus to complete the sentence.

On day 2, the number of hits predicted by a linear model is

(greater than, less than, equal to)

the number of hits predicted by the exponential model. On day 4, the number of hits predicted by a linear

model is  (greater than, less than, equal to) the number of hits predicted by the exponential model.

- 34 The table shows some values of a linear relationship between two quantities.

$x$	$f(x)$
5	6
8	?
?	42
14	60

Create a linear function  $f(x)$  that represents this relationship in terms of  $x$ .

← → ↶ ↷ ✖

1	2	3	$f(x)$	$x$
4	5	6	+	-
7	8	9	<	≤
0	.	-	$\frac{\square}{\square}$	$\square^\square$

- 35 The value  $V_A$  of stock A  $t$  months after it is purchased is modeled by the function  $V_A(t) = t^2 + 1.50$ . The value  $V_B$  of stock B  $t$  months after it is purchased is modeled by the function  $V_B(t) = 10(1.25)^t$ . Based on the model, for which  $t$ -values is the value of stock B greater than the value of stock A?

- Ⓐ  $t = 5$   
 Ⓑ  $t = 6$   
 Ⓒ  $t = 7$   
 Ⓓ  $t = 11$   
 Ⓔ  $t = 12$