

Name: Solutions

Mathematics

Unit 1 - Section 1 (Non-Calculator)

Algebra 1

#2

This unit has two sections: a non-calculator and a calculator section.

You will now take the first section of this unit in which you may not use a calculator. You will not be allowed to return to the non-calculator section of the test after you have started the calculator section. You will need to finish both sections within the allotted testing time.

Once you finish the non-calculator section, read the directions in your test booklet on how to continue.

1. 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.

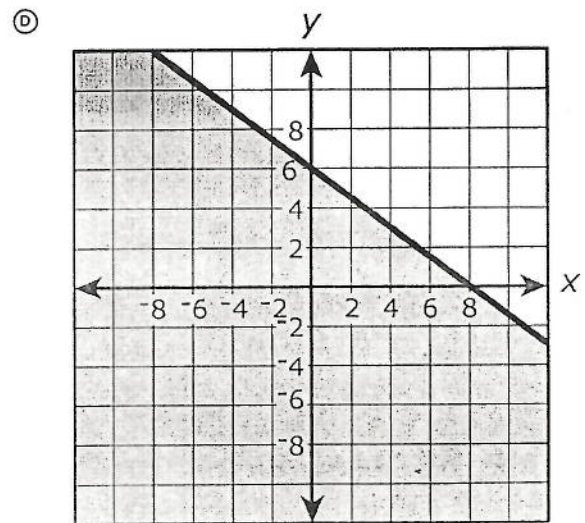
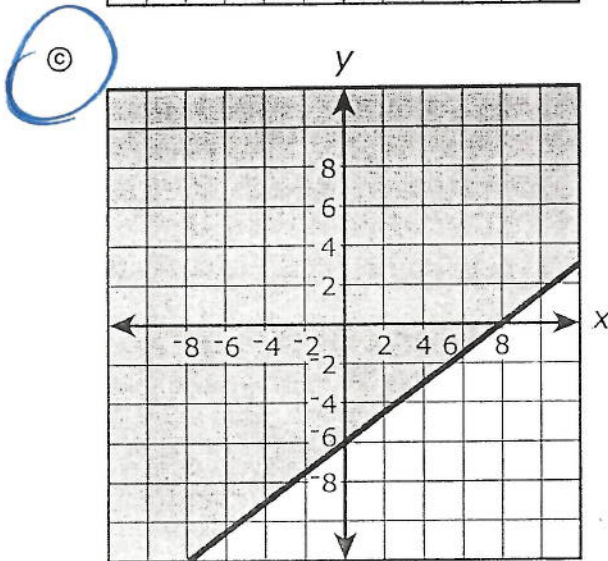
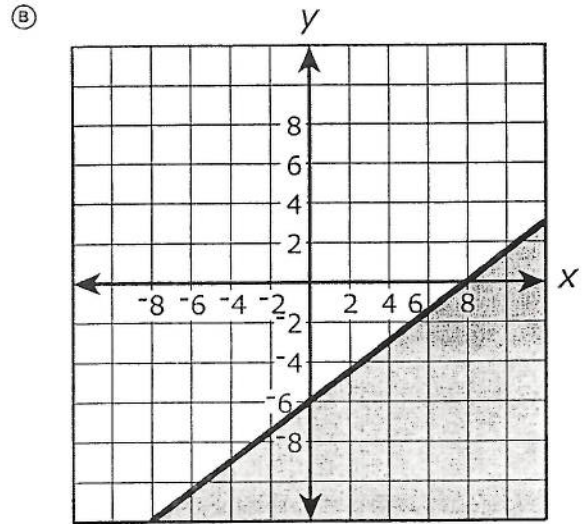
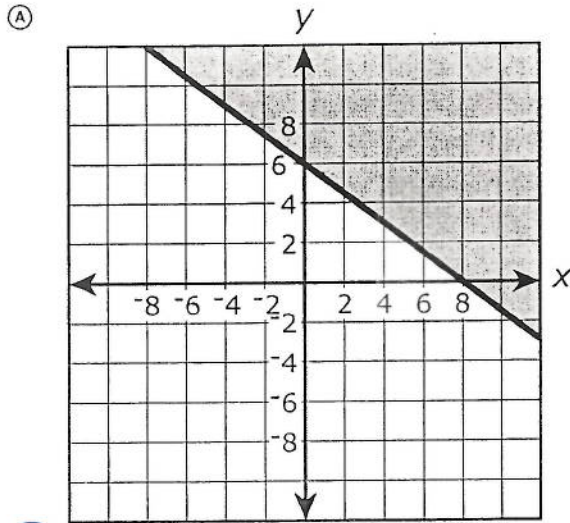
Ⓐ $C(4) = 99.50$

Ⓑ $C(398) = 4$

Ⓒ $C(4) = 398$

Ⓓ $C(99.50) = 1$

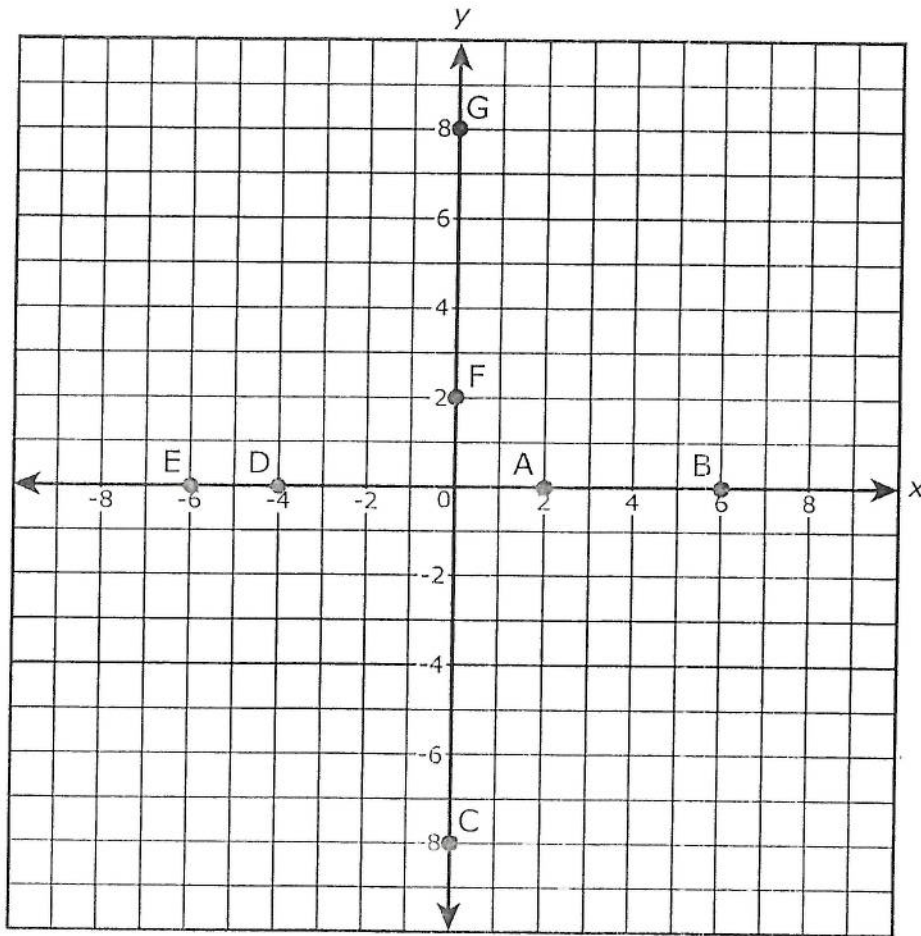
2. Which is a graph of the solution set of the inequality $3x - 4y \leq 24$?



$$\begin{aligned} -4y &\leq -3x + 24 \\ \hline -4 & \\ y &\geq -6 + \frac{3}{4}x \end{aligned}$$

*divide by neg
flip inequality*

3. 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)

$$x^2 + 2x - 8 = 0$$

$$(x + 4)(x - 2) = 0$$

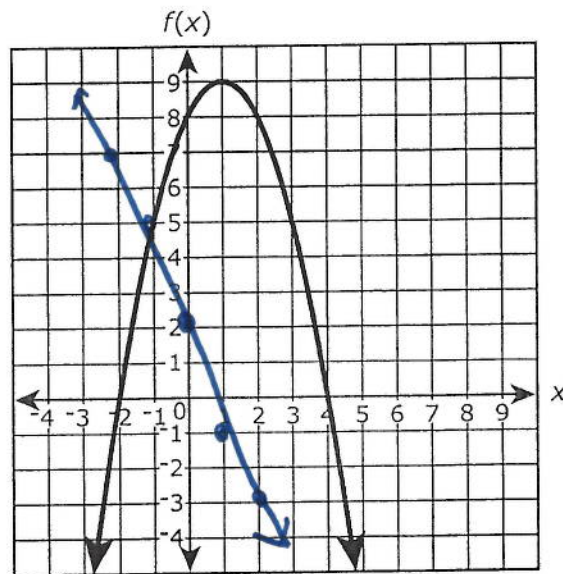
$$x + 4 = 0 \quad x - 2 = 0$$

$$x = -4 \quad x = 2$$

$$x - 6 = 0$$

$$x = 6$$

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



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

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

- (A) $f(-2)$ is greater than $g(-2)$. *@x=-2... g(x) is greater*
- (B) $f(-1)$ is less than $g(-1)$. *@x=-1.. they are equal*
- (C) $f(0)$ is greater than $g(0)$.
- (D) $f(1)$ is less than $g(1)$.
- (E) $f(2)$ is greater than $g(2)$.

$f(2) = 8$
 $g(2) = -4$ ✓

Use the information provided to answer Part A and Part B for question 5.

Consider the equation $(x^2 + 3)^2 + 21 = 10x^2 + 30$.

5. Part A

$$(x^2+3)^2 + 21 = 10(x^2+3)$$

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) $u^2 - 10u + 21 = 0$

if $u = x^2 + 3$

$$u^2 + 21 = 10u$$

Part B

What are the solutions of the equation $(x^2 + 3)^2 + 21 = 10x^2 + 30$?

Select **all** that apply.

(A) -4

(B) -3

(C) -2

(D) 0

(E) 2

(F) 3

(G) 4

$$u^2 - 10u + 21 = 0$$

$$(u-7)(u-3) = 0$$

$$u = 7 \quad u = 3$$



$$x^2 + 3 = 7$$

$$x^2 = 4$$



$$x^2 + 3 = 3$$

$$x^2 = 0$$



11. A random sample of 200 teenagers participated in a taste test. Each teenager sampled four choices of fruit drink (labeled A, B, C, and D), and then were asked to pick a favorite. The table shows the results of this taste test.

	A	B	C	D	Total
Boys	45	25	30	20	120
Girls	25	10	30	15	80
Total	70	35	60	35	200

Based on the information given, which of the given statements are true?

Select **all** that apply.

- Ⓐ 40% of the participants were girls. $\frac{80}{200}$
- Ⓑ 70% of the participants preferred A.
- Ⓒ $\frac{20}{120}$ of the boys preferred D.
- Ⓓ $\frac{10}{35}$ of the participants who preferred B were girls.
- Ⓔ The proportion of boys who preferred C is equal to the proportion of girls who preferred C.



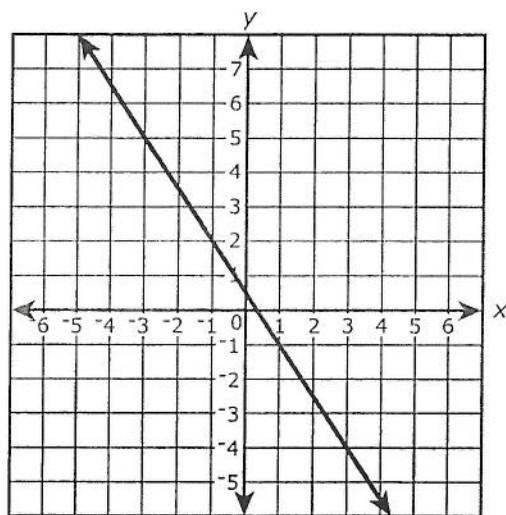
14. A ball was thrown upward into the air. The height, in feet, of the ball above the ground t seconds after being thrown can be determined by the expression $-16t^2 + 40t + 3$. What is the meaning of the 3 in the expression?
- (A) The ball took 3 seconds to reach its maximum height.
 - (B) The ball took 3 seconds to reach the ground.
 - (C) The ball was thrown from a height of 3 feet.
 - (D) The ball reached a maximum height of 3 feet.
15. A local theater sells admission tickets for \$9.00 on Thursday nights. At capacity, the theater holds 100 customers. The function $M(n) = 9n$ represents the amount of money the theater takes in on Thursday nights, where n is the number of customers. What is the domain of $M(n)$ in this context?
- (A) all whole numbers
 - (B) all non-negative rational numbers
 - (C) all non-negative integers that are multiples of 9
 - (D) all non-negative integers less than or equal to 100



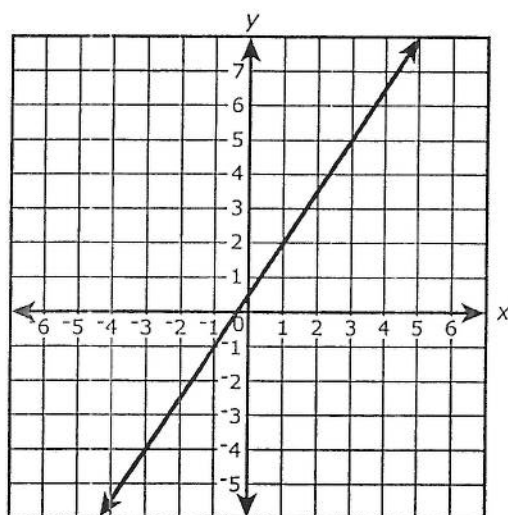
18. The ordered pairs $(20, -29.5)$, $(21, -31)$, and $(22, -32.5)$ are points on the graph of a linear equation.

Which of the following graphs shows **all** of the ordered pairs in the solution set of this linear equation?

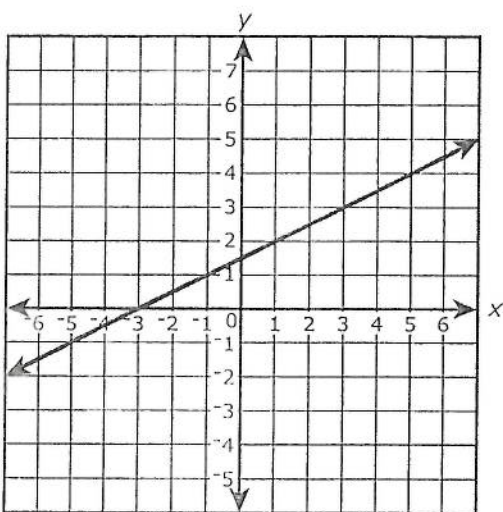
(Handwritten circled 'A')



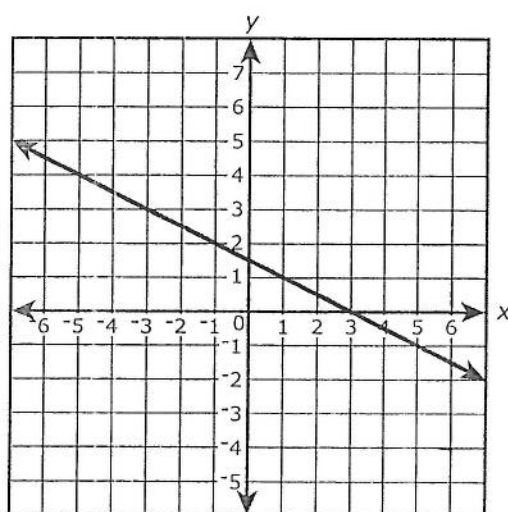
(B)



(C)



(D)



"stat" "edit"

"stat" "linreg"

L_1	L_2
20	-29.5
21	-31
22	-32.5



Use the information provided to answer Part A and Part B for question 25.

In a basketball game, Marlene made 16 field goals. Each of the field goals were worth either 2 points or 3 points, and Marlene scored a total of 39 points from field goals.

25. Part A

Let x represent the number of 2-point field goals and y represent the number of 3-point field goals. Which equations can be used as a system to model the situation?

Select **all** that apply.

- A $x + y = 16$
- B $x + y = 39$
- C $2x + 3y = 16$
- D $2x + 3y = 39$
- E $3x + 2y = 16$
- F $3x + 2y = 39$

Part B

How many 3-point field goals did Marlene make in the game?

Enter your answer in the box.

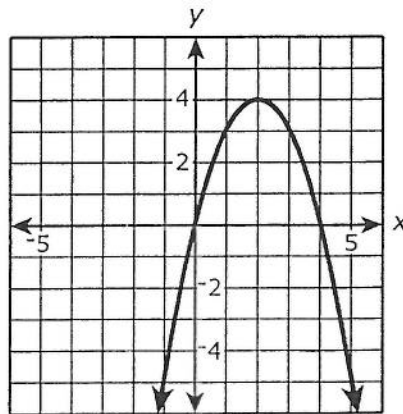
⊖						
•	•	•	•	•	•	•
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

$$\begin{aligned}
 x + y &= 16 & x &= 16 - y \\
 2x + 3y &= 39 & \swarrow & \\
 2(16 - y) + 3y &= 39 \\
 32 - 2y + 3y &= 39 \\
 y &= 7
 \end{aligned}$$



Use the information provided to answer Part A and Part B for question 27.

The function $f(x) = 4x - x^2$ is graphed in the xy -coordinate plane as shown.



read from left to right.

27. Part A

Based on the graph of the function, which statements are true?

Select **all** that apply.

- Ⓐ f is increasing on the interval $x < 0$.
- Ⓑ f is decreasing on the interval $x < 0$.
- Ⓒ f is increasing on the interval $0 < x < 2$.
- Ⓓ f is decreasing on the interval $0 < x < 2$.
- Ⓔ f is increasing on the interval $2 < x < 4$.
- Ⓕ f is decreasing on the interval $2 < x < 4$.
- Ⓖ f is increasing on the interval $x > 4$.
- Ⓗ f is decreasing on the interval $x > 4$.



Part B

Based on the graph of the function, which statements are true?

Select **all** that apply.

- Ⓐ $f(x) < 0$ on the interval $x < 0$. *this means $x < 0$.. graph is below y axis*
- Ⓑ $f(x) > 0$ on the interval $x < 0$. *$f(x) = y$*
- Ⓒ $f(x) < 0$ on the interval $0 < x < 2$.
- Ⓓ $f(x) > 0$ on the interval $0 < x < 2$. *the graph is above y axis.. pos $f(x)$.*
- Ⓔ $f(x) < 0$ on the interval $2 < x < 4$.
- Ⓕ $f(x) > 0$ on the interval $2 < x < 4$.
- Ⓖ $f(x) < 0$ on the interval $x > 4$.
- Ⓗ $f(x) > 0$ on the interval $x > 4$.