

Common Core Algebra 1 Midterm Review Packet #1

## Multiple Choice Questions:

1. The expression  $-|-7|$  is equivalent to

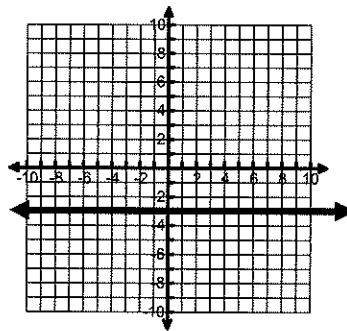
- (1) 1            (3) 7  
 (2) 0            (4) -7

2. If  $a = -4$  and  $b = 3$ , what is the value of  $|a| + |b|$ 

- (1) 7            (3) 1  
 (2) -7          (4) -1

3. The diagram at the right shows the graph of which equation?

- (1)  $y = 3$   
 (2)  $y = -3$   
 (3)  $x = 3$   
 (4)  $x = -3$

4. If  $x = -4$  and  $y = 3$ , what is the value of  $x - 3y^2$ ?

- (1) -13          (3) -31  
 (2) -23          (4) -85

$$-4 - 3(9)$$

5. If  $t = -3$ , then  $3t^2 + 5t + 6$  equals

- (1) -36          (3) 6  
 (2) -6            (4) 18

$$3(9) - 15 + 6$$

$$27 - 15 + 6$$

$$12 + 6$$

6. Which property is illustrated by the equation  $4x(2x - 1) = 8x^2 - 4x$ ?

- (1) associative            (3) distributive  
 (2) commutative        (4) identity

7. Which equation illustrates the associative property of addition?

(1)  $x + y = y + x$

(2)  $3(x + 2) = 3x + 6$

(3)  $(3 + x) + y = 3 + (x + y)$

(4)  $3 + x = 0$

8. If  $a$  and  $b$  are integers, which equation is always true?

(1)  $\frac{a}{b} = \frac{b}{a}$

(3)  $a - b = b - a$

(2)  $a + 2b = b + 2a$

(4)  $a + b = b + a$

9. If  $n$  represents an odd number, which computation results in an answer that is an even number?

(1)  $2 \times n + 1$

(2)  $2 \times n - 1$

(3)  $3 \times n - 2$

(4)  $3 \times n + 1$

*odd · odd + 1  
odd + 1 ⇒ even*

10. Mrs. Smith wrote "Eight less than three times a number is greater than fifteen" on the board. If  $x$  represents the number, which inequality is a correct translation of this statement?

(1)  $3x - 8 > 15$

(2)  $3x - 8 < 15$

(3)  $8 - 3x > 15$

(4)  $8 - 3x < 15$

$3x - 8 > 15$

11. The sum of Scott's age and Greg's age is 33 years. If Greg's age is represented by  $g$ , Scott's age is represented by

(1)  $33 - g$

(2)  $g - 33$

(3)  $g + 33$

(4)  $33g$

*↳ sum is total here*

$33 - g$  Whole-Part

12. If  $-2x + 3 = 7$  and  $3x + 1 = 5 + y$ , the value of  $y$  is

(1) 1

(2) 0

(3) -10

(4) 10

$-2x + 3 = 7$

$-3 - 3$

$-2x = 4$

$\frac{-2}{-2} \quad \frac{4}{-2}$

$x = -2$

$3(-2) + 1 = 5 + y$

$-6 + 1 = 5 + y$

$-5 = 5 + y$

$-10 = y$

13. If  $9x + 2a = 3a - 4x$ , then  $x$  equals

(1)  $a$

(2)  $-a$

(3)  $\frac{5a}{12}$

(4)  $\frac{a}{13}$

$9x + 2a = 3a - 4x$

$+4x$

$+4x$

$13x + 2a = 3a$

$-2a - 2a$

$\frac{13x}{13} = \frac{a}{13}$

14. If  $x = 2a - b^2$ , then  $a$  equals

(1)  $\frac{x-b^2}{2}$

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

(2)  $\frac{x+b^2}{2}$

(4)  $x+b^2$

$$\begin{array}{r} x = 2a - b^2 \\ + b^2 \quad + b^2 \\ \hline \frac{x+b^2}{2} = \frac{2a}{2} \end{array}$$

15. If  $2x + 5 = -25$  and  $-3m - 6 = 48$ , what is the product of  $x$  and  $m$ ?

(1) -270

(3) 3

(2) -33

(4) 270

Multiply

$$\begin{array}{r} 2x + 5 = -25 \\ 2x = -30 \\ x = -15 \end{array} \quad \begin{array}{r} -3m - 6 = 48 \\ -3m = 54 \\ m = -18 \end{array}$$

16. At the beginning of her mathematics class, Mrs. Reno gives a warm-up problem. She says, "I am thinking of a number such that 6 less than the product of 7 and this number is 85." Which number is she thinking of?

(1) 11

(3) 84

(2) 13

(4) 637

$$\begin{array}{r} 7x - 6 = 85 \\ 7x = 91 \\ x = 13 \end{array}$$

17. If one-half of a number is 8 less than two-thirds of the number, what is the number?

(1) 24

(3) 48

(2) 32

(4) 54

$$\begin{array}{r} \left[ \frac{1}{2}x = \frac{2}{3}x - 8 \right] \cdot 6 \\ 3x = 4x - 48 \\ x = 48 \end{array}$$

18. If the temperature in Buffalo is  $23^\circ$  Fahrenheit, what is the temperature in degrees Celsius? [Use the formula  $C = \frac{5}{9}(F - 32)$ .]

(1) -5

(3) -45

(2) 5

(4) 45

$$\begin{array}{r} C = \frac{5}{9}(23 - 32) \\ \frac{5}{9}(-9) = 5(-1) \end{array}$$

19. If  $3ax + b = c$ , then  $x$  equals

(1)  $c - b + 3a$

(3)  $\frac{c-b}{3a}$

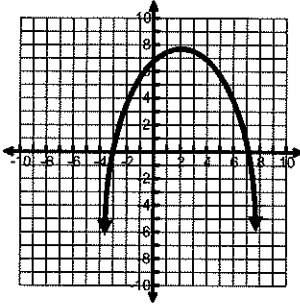
(2)  $c + b - 3a$

(4)  $\frac{b-c}{3a}$

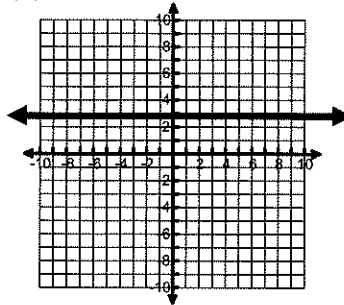
$$\begin{array}{r} 3ax + b = c \\ -b \quad -b \\ \hline 3ax = \frac{c-b}{3a} \end{array}$$

20. Which graph does *not* represent a linear function?

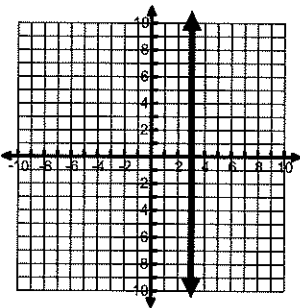
(1)



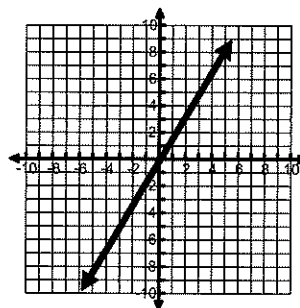
(3)



(2)



(4)



21. If  $x$  and  $y$  are defined as indicated by the accompanying table, which equation correctly represents the relationship between  $x$  and  $y$ ?

$x$	$y$
2	1
3	3
5	7
7	11

Look out - see domain  $m = \frac{\Delta y}{\Delta x} = \frac{3-1}{3-2} = 2$   
 $(2, 1), m = 2$

$$y - y_1 = m(x - x_1) \text{ or } y = mx + b$$

(1)  $y = x + 2$

(3)  $y = 2x + 3$

(2)  $y = 2x + 2$

(4)  $y = 2x - 3$

$$y - 1 = 2(x - 2)$$

$$y - 1 = 2x - 4$$

$$+1 \quad +1$$

$$y = 2x - 3$$

$$1 = 2(2) + b$$

$$1 = 4 + b$$

$$-3 = b$$

$$y = 2x - 3$$

22. Which statement describes the graph of  $x = 4$ ?

(1) It passes through the point  $(0, 4)$ .

(2) It has a slope of 4.

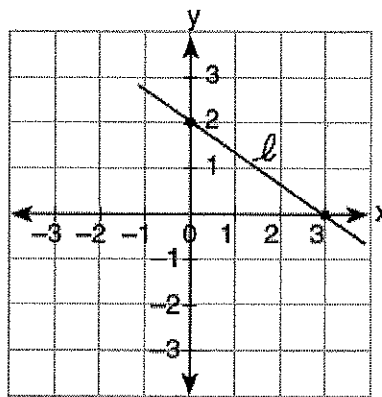
(3) It is parallel to the  $y$ -axis.

(4) It is parallel to the  $x$ -axis.

$V \cup x \quad H \cup y$

23. What is the slope of line  $\ell$  in the accompanying diagram?

- (1)  $-\frac{3}{2}$       (3)  $\frac{2}{3}$   
 (2)  $-\frac{2}{3}$       (4)  $\frac{3}{2}$



24. If point  $(-1, 0)$  is on the line whose equation is  $y = 2x + b$ , what is the value of  $b$ ?

- (1) 1      (3) 3  
 (2) 2      (4) 0

$$0 = 2(-1) + b$$

$$2 = b$$

25. What is the slope of the line whose equation is  $3x - 4y - 16 = 0$ ?

- (1)  $\frac{3}{4}$       (3) 3  
 (2)  $\frac{4}{3}$       (4) -4

$$\rightarrow \left(\frac{3}{4}\right) \frac{3x - 16 = 4y}{4} = \frac{4y}{4}$$

Same slope  
different y-intercept

26. Which equation represents a line that is parallel to the line whose equation is  $2x + 3y = 12$ ?

- (1)  $6y - 4x = 2$       (3)  $4x - 6y = 2$   
 (2)  $6y + 4x = 2$       (4)  $6x + 4y = -2$

$$\rightarrow \frac{4x+2}{6} \frac{2}{6}$$

$$\rightarrow \frac{-4x+2}{6} \frac{2}{6}$$

$$\frac{-4}{6} \text{ is } -\frac{2}{3}$$

$$2x + 3y = 12$$

$$\begin{array}{r} -2x \quad -2x \\ \hline 3y = -2x + 12 \\ \frac{3y}{3} = \frac{-2x}{3} + \frac{12}{3} \end{array}$$

$$y = -\frac{2}{3}x + 4$$

27. Which ordered pair is the solution of the following system of equations?

- (1)  $(2, -1)$       (3)  $(-4, 8)$   
 (2)  $(2, -5)$       (4)  $(-4, -8)$

$$\begin{array}{r} 3x + 2y = 4 \\ -1(-2x + 2y = 24) \end{array}$$

$$\begin{array}{r} 3x + 2y = 4 \\ 2x - 2y = -24 \\ \hline 5x = -20 \\ x = -4 \end{array}$$

$$\begin{array}{r} 3x + 2y = 4 \\ -12 + 2y = 4 \\ 2y = 16 \\ y = 8 \end{array}$$

28. The equations  $5x + 2y = 48$  and  $3x + 2y = 32$  represent the money collected from school concert ticket sales during two class periods. If  $x$  represents the cost for each adult ticket and  $y$  represents the cost for each student ticket, what is the cost for each adult ticket?

- (1) \$20  
(2) \$10

- (3) \$8  
(4) \$4

→ Find  $x$

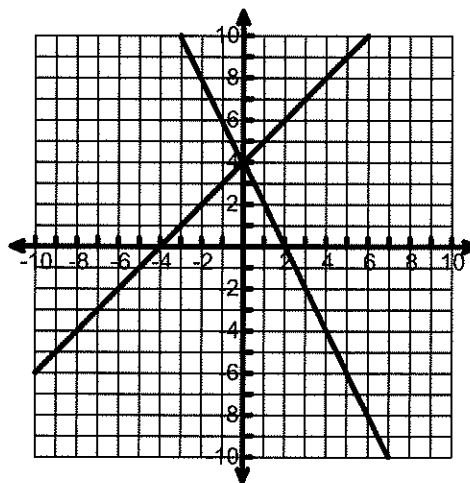
$$\begin{array}{r} 5x + 2y = 48 \\ -3x - 2y = -32 \\ \hline 2x = 16 \\ x = 8 \end{array}$$

$$\begin{array}{r} 3x + 2y = 32 \\ 3(8) + 2y = 32 \\ 24 + 2y = 32 \\ 2y = 8 \\ y = 4 \end{array}$$

29. Which point is the solution set of the system of equations shown in the accompanying graph?

- (1) (0,4)  
(2) (2,4)

- (3) (-4,1)  
(4) (4, -1)



30. Which value of  $x$  is not in the solution set of the inequality  $-2x + 15 > 17$ ?

- (1) -8  
(2) -6

- (3) -4  
(4) 12

$$\begin{array}{r} -2x + 15 > 17 \\ -15 \quad -15 \\ \hline -2x > 2 \\ x < -1 \end{array}$$

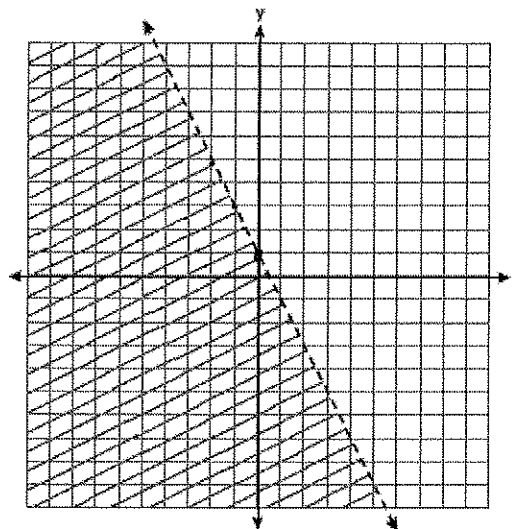
31. Which inequality is represented by the below?

(1)  $y < 2x + 1$

(3)  $y < \frac{1}{2}x + 1$

(2)  $y < -2x + 1$

(4)  $y < -\frac{1}{2}x + 1$



graph

Free Response Questions:

1. What is the value of  $x$  in the equation?  $13x - 2(x+4) = 8x + 1$ ?

$$\begin{array}{r}
 13x - 2x - 8 = 8x + 1 \\
 11x - 8 = 8x + 1 \\
 \underline{-8x \quad -8x} \\
 3x = 8 + 1
 \end{array}
 \rightarrow 3x = 9$$

$$x = 3$$

2. Sara's telephone service costs \$21 per month plus \$0.25 for each local call, and long-distance calls are extra. Last month, Sara's bill was \$36.64, and it included \$6.14 in long-distance charges. How many local calls did she make?

$$36.64 - 6.14 = 30.50$$

$$\begin{array}{r}
 0.25c + 21 = 30.50 \\
 \underline{-21 \quad -21} \\
 0.25c = 9.50
 \end{array}$$

$c = 38$   
She made 38 local calls

3. Solve for  $x$ :  $3.3 - x = 3(x - 1.7)$

$$3.3 - x = 3x - 5.1$$

$$\frac{8.4}{4} = \frac{4x}{4}$$

$$2.1 = x$$

4. The tickets for a dance recital cost \$5.00 for adults and \$2.00 for children. If the total number of tickets sold was 295 and the total amount collected was \$1,220, how many adult tickets were sold?

Let  $x = \# \text{ adult tickets}$ ,  $y = \# \text{ children's tickets}$

$$x + y = 295$$

$$5x + 2y = 1220$$

$$y = 295 - x$$

$$5x + 2(295 - x) = 1220$$

$$5x + 590 - 2x = 1220$$

$$3x = 630$$

$$x = 210$$

210 adult tickets sold

5. A swimmer plans to swim at least 100 laps during a 6-day period. During this period, the swimmer will increase the number of laps completed each day by one lap. What is the least number of laps the swimmer must complete on the first day?

$$x + (x+1) + (x+2) + (x+3) + (x+4) + (x+5) \geq 100$$

$$\begin{array}{r}
 6x + 15 \geq 100 \\
 \underline{-15 \quad -15} \\
 6x \geq 85 \\
 \underline{\quad \quad 6} \\
 x \geq 14 \frac{1}{6}
 \end{array}$$

Least # laps first day is 15.

6. Solve  $\left(\frac{3}{4}x + 2 = \frac{5}{4}x - 6\right) \cdot 4$

$$3x + 8 = 5x - 24$$

$$-2x = -32$$

$$x = 16$$

$$\frac{8}{7} - \frac{21}{7} = \frac{-13}{7}$$

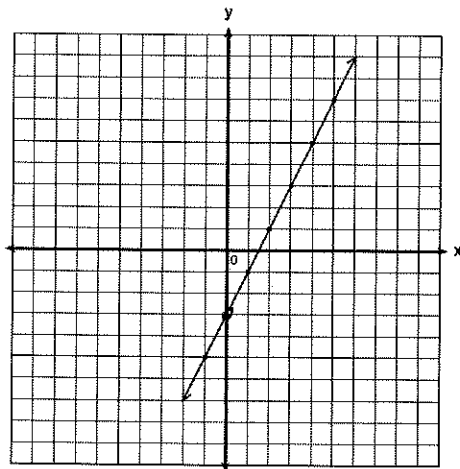
7. Write an equation that represents the line that passes through the points (2, -3) and (-5, 1).

	Point Slope	<u>Slope intercept</u>
$m = \frac{1 - (-3)}{-5 - 2} = \frac{4}{-7}$	$y + 3 = -\frac{4}{7}(x - 2)$	$y = -\frac{4}{7}x + \frac{8}{7} - 3$
	$y - 1 = -\frac{4}{7}(x + 5)$	$y = -\frac{4}{7}x - \frac{13}{7}$

8. Write an equation of the line parallel to  $y = \frac{2}{3}x - 2$  and that passes through the point (3, 7).

Point Slope	Slope - intercept
$y - 7 = \frac{2}{3}(x - 3)$	$y = \frac{2}{3}x - \frac{2}{3}(3) + 7$
	$y = \frac{2}{3}x - 2 + 7$
	$y = \frac{2}{3}x + 5$

9. Write the equation for the line shown in the accompanying graph. Explain your answer.



$$b = -3$$

$$m = 2$$

$$y = 2x - 3$$



10. Solve graphically:

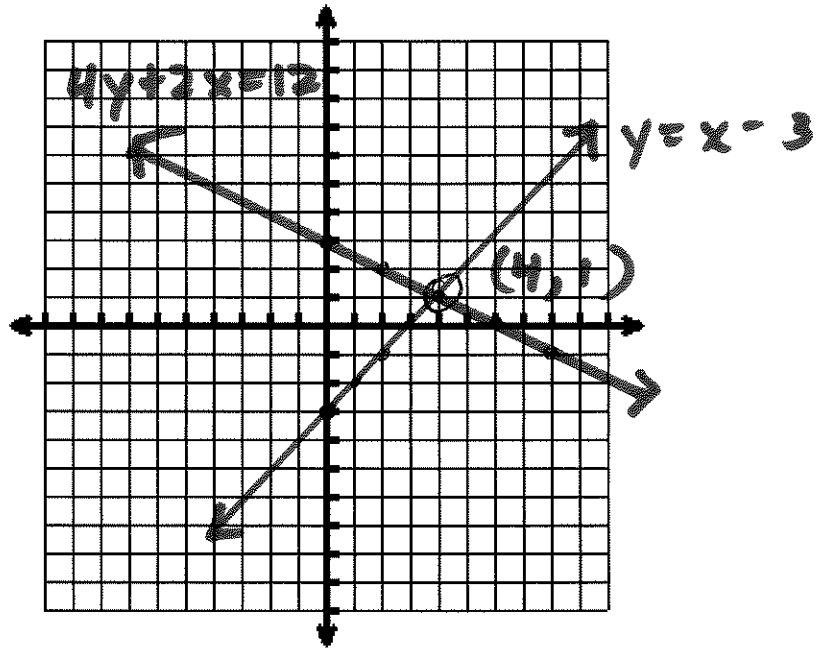
$$4y + 2x = 12$$

$$y = x - 3$$

$$4y + 2x = 12$$

$$4y = -2x + 12$$

$$y = -\frac{1}{2}x + 3$$



11. Graph:  $2x - y \geq 4$

$$-y \geq -2x + 4$$

$$y \leq 2x - 4$$

