

Name _____

Date _____

Common Core Algebra 1 Midterm XTRA Problems

1. Solve for x : $\frac{x}{2} + 1 = \frac{-x}{5} + 15$

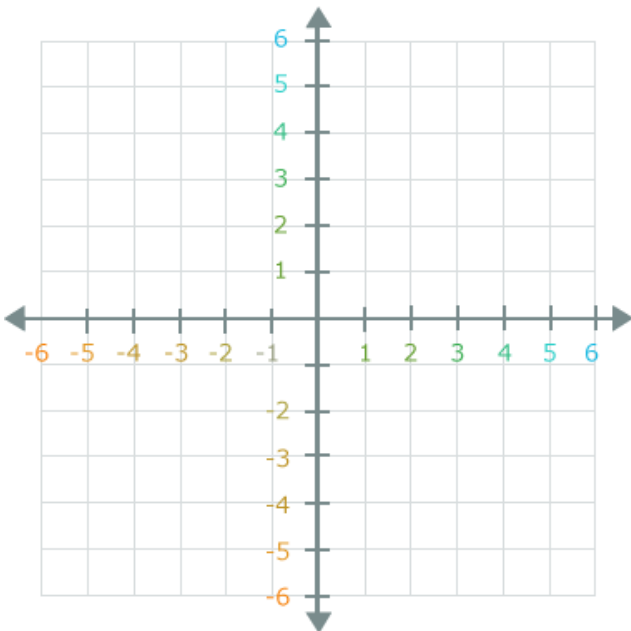
Use the LCD!

2. Write the equation of the line that passes through the points (1, 5) and (-2, 11).

3. a) State the vertex and graph the equation $f(x) = |x|$

b) State the vertex and graph the equation $g(x) = |x - 3| + 1$

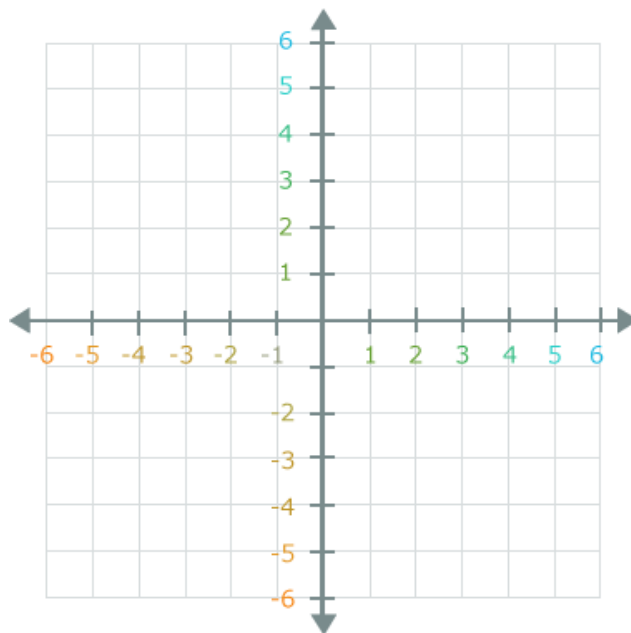
on the same graph as part a)



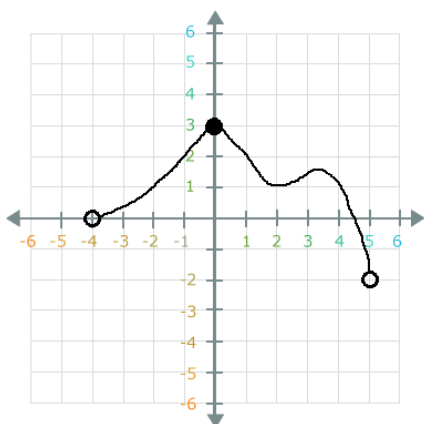
Describe in detail how the graph of $g(x)$ is related to the graph $f(x)$ in terms of shifts.

4. Graph the piecewise function

$$y = \begin{cases} -2x, & x < 3 \\ 4, & x \geq 3 \end{cases}$$

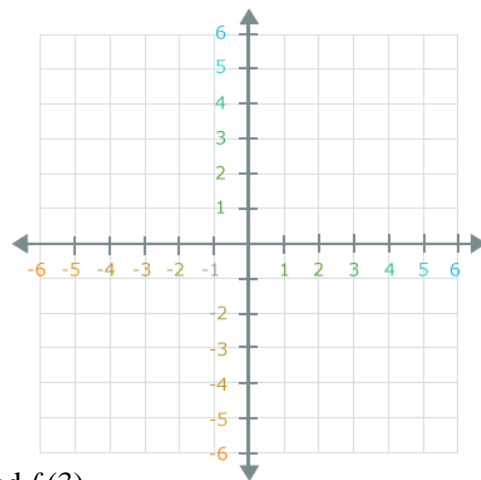


5. State the Domain and Range of the following function.



6. Graph the inequality (and shade!!)

$$-2y < x + 6$$



7. Given the recursive sequence: $f(1) = 3$, $f(n) = 2 \cdot f(n - 1) + 1$. Find $f(3)$

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Common Core Algebra 1 Midterm XTRA Problems

1. Solve for x: $\left[\frac{x}{2} + 1 = \frac{-x}{5} + 15 \right] \cdot 10$

$$\begin{array}{r} 5x + 10 = -2x + 150 \\ +2x \quad -10 \quad +2x \quad -10 \\ \hline 7x = 140 \\ \frac{7x}{7} = \frac{140}{7} \end{array}$$

$x = 20$

Use the LCD!

$LCD = 10!$

2. Write the equation of the line that passes through the points $(1, 5)$ and $(-2, 11)$.

find slope 1^{st}

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{11 - 5}{-2 - 1} = \frac{6}{-3} = -2$$

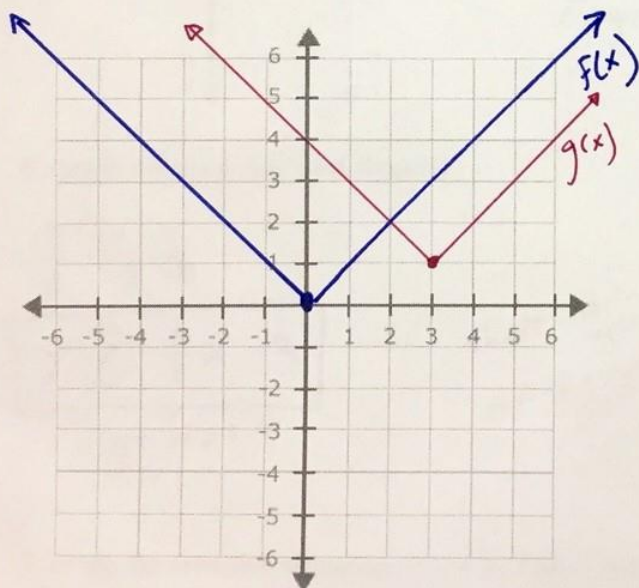
$y = -2x + b$

find y-int 2^{nd}

$$\begin{array}{r} y = -2x + b \\ (5) = -2(1) + b \\ 5 = -2 + b \\ +2 \quad +2 \\ \hline 7 = b \end{array}$$

$y = -2x + 7$

3. a) State the vertex and graph the equation $f(x) = |x|$ ~~///~~ $(0, 0)$
 b) State the vertex and graph the equation $g(x) = |x - 3| + 1$ ~~///~~ $(3, 1)$ on the same graph as part a)



calculator!!

- 1) $y =$
- 2) MATH, arrow \rightarrow to NUM
- 3) abs() gives you the || bars!
- 4) graph to see graph
- 5) 2^{nd} table graph to see table of values!!

Describe in detail how the graph of $g(x)$ is related to the graph $f(x)$ in terms of shifts.

shifted right 3 (not left!!!)
up 1

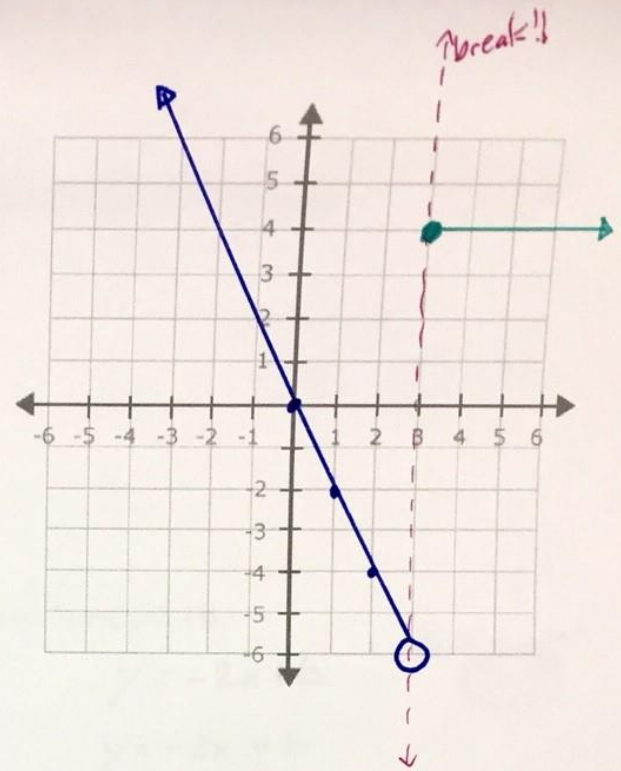
4. Graph the piecewise function

$$y = \begin{cases} -2x, & x < 3 \\ 4, & x \geq 3 \end{cases}$$

open O at 3

the break is at 3

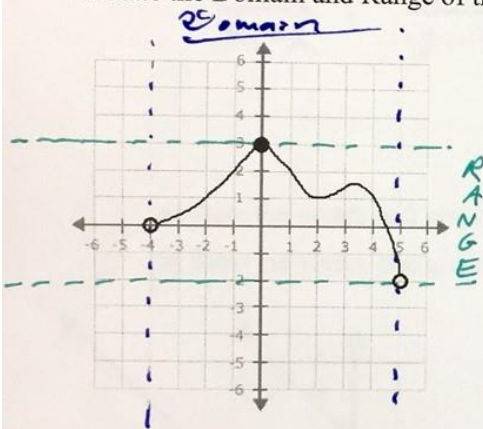
closed at 3



x	y = -2x
0	0
1	-2
2	-4
3	-6

x	y = 4
3	4
4	4
5	4
6	4

5. State the Domain and Range of the following function.



Domain (x values) or (walls)

$$-4 < x < 5$$

open circles on each end so < and not <=

Range (y values) or (floor/ceiling)

$$-2 < y \leq 3$$

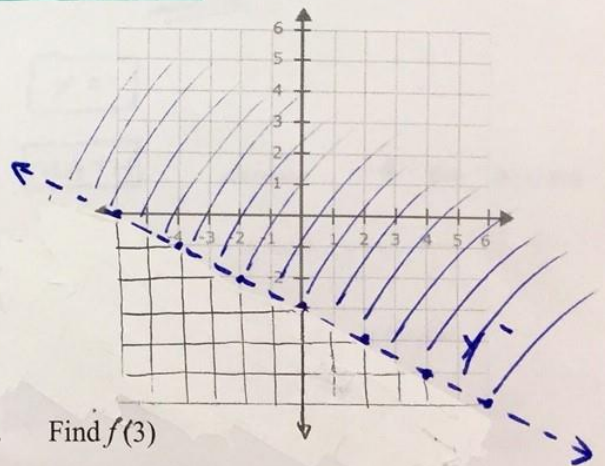
6. Graph the inequality (and shade!!)

$$\frac{-2y < x + 6}{-2} \frac{<}{-2} \frac{-2}{-2}$$

$$y > -\frac{1}{2}x - 3$$

sign flips!!!

shade above and dashed line



7. Given the recursive sequence: $f(1) = 3$, $f(n) = 2 \cdot f(n-1) + 1$. Find $f(3)$

$$f(1) = 3$$

$$f(2) = 2 \cdot f(1) + 1 = 2(3) + 1 = 7$$

$$f(3) = 2 \cdot f(2) + 1 = 2(7) + 1 = 15$$

15