

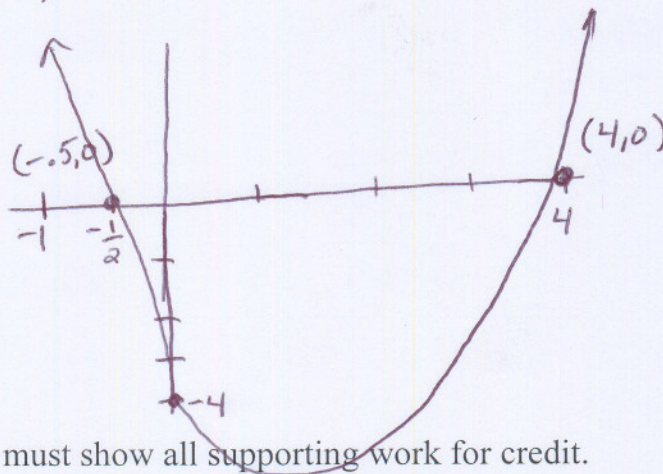
Show all work for credit. Turn in all scratch work in a neat and orderly fashion.

1. Solve by the **graphing method**. You must show all supporting work for credit.

(10) $2x^2 - 7x - 4 = 0$

$$y_1 = 2x^2 - 7x - 4$$
$$y_2 = 0$$

$x = -0.5, 4$



2. Solve by the **factoring method**. You must show all supporting work for credit.

(10) $2x^2 - 7x - 4 = 0$

$$(2x + 1)(x - 4) = 0$$

$$2x + 1 = 0 \quad x - 4 = 0$$

$$2x = -1$$

$x = 4$

$x = -\frac{1}{2}$

3. Solve by the **quadratic formula method**. You must show all supporting work for credit.

(10) $2x^2 - 7x - 4 = 0$

$$a = 2 \quad b = -7 \quad c = -4$$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(2)(-4)}}{2(2)}$$

$$x = \frac{7 \pm \sqrt{49 + 32}}{4}$$

$$x = \frac{7 \pm \sqrt{81}}{4} = \frac{7 \pm 9}{4}$$

$x = \frac{7+9}{4} = 4$

$x = \frac{7-9}{4} = -\frac{1}{2}$

4. Solve by the **extraction of roots method**. You must show supporting work for credit.

$$5x^2 - 10 = 0$$

⑩

$$5x^2 = 10$$

$$\sqrt{x^2} = \sqrt{2}$$

$$x = \pm\sqrt{2}$$

5. Solve $\sqrt{9x + 67} - 5 = x$

⑩

$$(\sqrt{9x+67})^2 = (x+5)^2$$

$$9x+67 = x^2 + 10x + 25$$

$$0 = x^2 + x - 42$$

$$0 = (x+7)(x-6)$$

$$x+7=0 \quad x-6=0$$

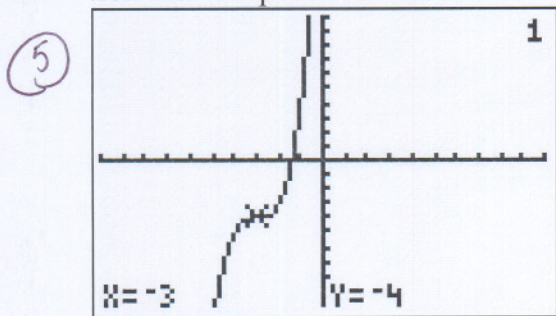
$$x=-7 \quad x=6$$

check

$$\sqrt{9 \cdot 7 + 67} - 5 \neq 7$$

$$\sqrt{9 \cdot 6 + 67} - 5 = 6$$

6. a. Use your shifting rules to find the equation of the given graph where each tick mark represents one unit.



left 3 down 4

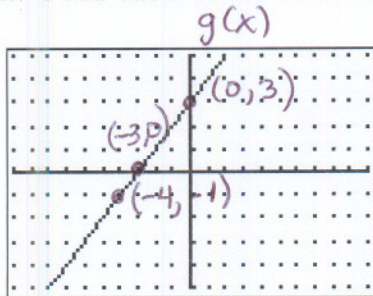
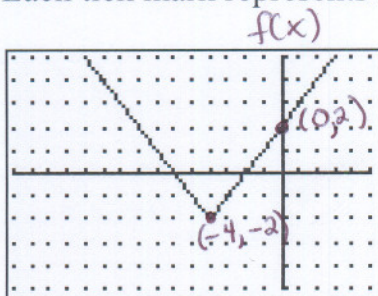
$$y = (x + 3)^3 - 4$$

b. Suppose the graph of $f(x) = |x|$ is shifted to the left 5 units and reflected around the x axis. What is the equation that gives the new graph?

⑤

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

7. Given the graph on the left to be $f(x)$ and the graph on the right to be $g(x)$. Each tick mark represents one unit. Find each of the following.



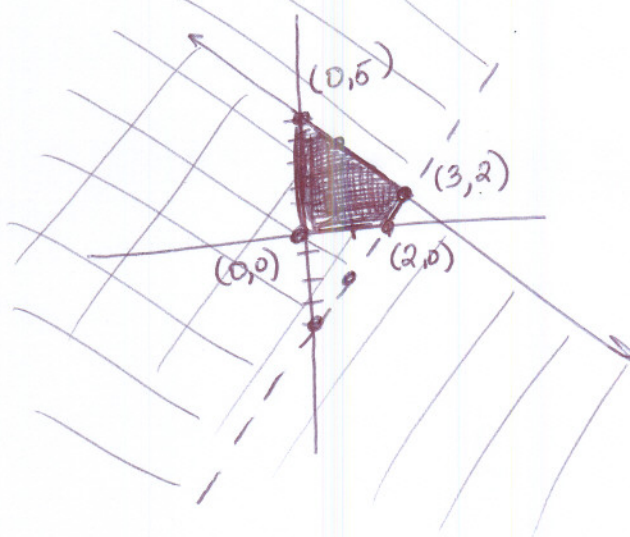
$$\begin{aligned} f(0) &= 2 \\ g(0) &= 3 \\ f(-4) &= -2 \\ g(-4) &= -1 \\ g(-3) &= 0 \\ f(0) &= 2 \end{aligned}$$

- ③ a. $(f+g)(0) = f(0) + g(0) = 2 + 3 = 5$
- ③ b. $(f \cdot g)(-4) = f(-4) \cdot g(-4) = -2 \cdot -1 = 2$
- ③ c. $(f \circ g)(-3) = f(g(-3)) = f(0) = 2$

8. Graph the system of inequalities and identify all corner points.

$$\begin{cases} x + y \leq 5 & \Rightarrow y \leq -x + 5 & \text{solid line} \\ 2x - y < 4 & \Rightarrow y > 2x - 4 & \text{dotted line} \\ x \geq 0, y \geq 0 & \Rightarrow \text{Quadrant I} \end{cases}$$

$$\begin{aligned} 2x - y &< 4 \\ -y &< -2x + 4 \\ \frac{-y}{-1} &< \frac{-2x + 4}{-1} \\ y &> 2x - 4 \end{aligned}$$



9. Find $f^{-1}(x)$, given $f(x) = \frac{4x-2}{3}$.

⑩

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

$$3x = 4y-2$$

$$3x+2 = 4y$$

$$\boxed{\frac{3x+2}{4} = y = f^{-1}(x)}$$

10. Given $f(x) = \sqrt{x+1}$ and $g(x) = 10x$, find each of the following.

⑤ a.) $(f \circ g)(x) = f(g(x)) = \boxed{\sqrt{10x+1}}$

⑤ b.) $(g \circ f)(x) = g(f(x)) = \boxed{10\sqrt{x+1}}$