

Math 203
Practic Tests + 4 Solutions

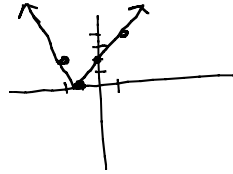
1. $f(x) = 7x + 10$
 $f(-2) = 7(-2) + 10 = -4$
 $f(-2x) = 7(-2x) + 10 = -14x + 10$
 $f(3x-1) = 7(3x-1) + 10 = 21x - 7 + 10 = 21x + 3$

2. $f(x) = x^2 + 1$
 $f(-2) = (-2)^2 + 1 = 4 + 1 = 5$
 $f(-2x) = (-2x)^2 + 1 = 4x^2 + 1$ FOIL
 $f(3x-1) = (3x-1)^2 + 1 = (3x-1)(3x-1) + 1 = 9x^2 - 3x - 3x + 1 + 1 = 9x^2 - 6x + 2$

3. domain = $(-\infty, a) \cup (a, \infty)$

4. $f(x) = 2|x+1|$

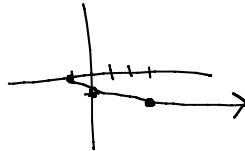
x	f(x)
-2	2
-1	0
0	2
1	4



domain: $(-\infty, \infty)$
range: $[0, \infty)$

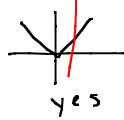
5. $f(x) = -\sqrt{x+1}$

x	f(x)
-1	0
0	-1
3	-2



domain: $[-1, \infty)$
range: $[0, -\infty)$

6. a. Yes. Every input value has a unique output value.
 b. No. The input value 0 is mapped to more than one output value.
 c. Yes. Every input value has a unique output value.
7. If a vertical line crosses a graph in more than one place, it is not the graph of a function.

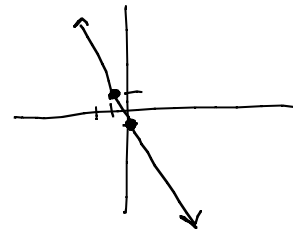


8. Method 1

point-slope form
 $y - y_1 = m(x - x_1)$
 $y - 1 = -2(x - (-1))$
 $y - 1 = -2(x + 1)$
 $y - 1 = -2x - 2$
 $+1 \quad +1$
 $y = -2x - 1$

Method 2

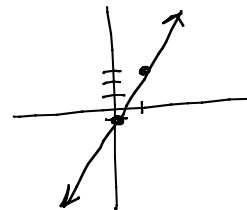
slope-intercept form
 $y = mx + b$
 $1 = -2(-1) + b$
 $1 = 2 + b$
 $-2 \quad -2$
 $-1 = b$
 so the equation is
 $y = -2x - 1$



9. $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 3}{2 - 1} = \frac{4}{1} = 4$

Method 1
point-slope form
 $y - y_1 = m(x - x_1)$
 $y - 3 = 4(x - 1)$
 $y - 3 = 4x - 4$
 $+3 \quad +3$
 $y = 4x - 1$

Method 2
slope-intercept form
 $y = mx + b$
 $3 = 4(1) + b$
 $3 = 4 + b$
 $-1 = b$
 $y = 4x - 1$



10. a. $F(x) = 4.50 + 0.07x$ or $f(x) = 0.07x + 4.50$ (slope-intercept form)

b. The bill when no minutes are used.

11. $y = -\frac{1}{2}x + 1$; $y = \frac{1}{4}x + 2$

$$-\frac{1}{2}x + 1 = \frac{1}{4}x + 2$$

Multiply both sides by LCD

$$4\left(-\frac{1}{2}x + 1\right) = 4\left(\frac{1}{4}x + 2\right)$$

$$-2x + 4 = x + 8$$

$$\begin{array}{r} -x \quad -x \\ -3x + 4 = 8 \\ -3x = 4 \\ x = -4/3 \end{array}$$

Substitute $x = -4/3$ into either equation.

$$y = -\frac{1}{2}\left(-\frac{4}{3}\right) + 1$$

$$y = \frac{4}{6} + 1$$

$$y = \frac{10}{6} = \frac{5}{3}$$

Intersection point = $\left(-\frac{4}{3}, \frac{5}{3}\right)$

12. $3x + 1 \leq 7$

$$\begin{array}{r} -1 \quad -1 \\ 3x \leq 6 \end{array}$$

$$x \leq 2$$

$$x \leq 2$$

$$(-\infty, 2]$$

13. $-\frac{x}{2} > 4(1-x)$

$$-\frac{x}{2} > 4 - 4x$$

Multiply both sides by LCD.

$$2\left(-\frac{x}{2}\right) > 2(4-4x)$$

$$\begin{array}{r} -x > 8 - 8x \\ +8x \quad +8x \end{array}$$

$$\frac{7x}{7} > \frac{8}{7}$$

$$x > 8/7$$

$$(8/7, \infty)$$

14. $-1 < -2x + 1 \leq 5$

$$\begin{array}{r} -1 \quad -1 \quad -1 \\ -2 < -2x \leq 4 \end{array}$$

$$\begin{array}{r} -2 < -2x \leq 4 \\ -2 \quad -2 \quad -2 \end{array}$$

$$1 > x \geq -2$$

$$[-2, 1)$$

15. $10,000g + 15g = 20g$

$$\begin{array}{r} 10,000g \quad -15g \\ \hline 10,000g \quad -15g \\ \hline \frac{10,000}{5} = \frac{5g}{5} \end{array}$$

$$2000 = g$$

2000 units