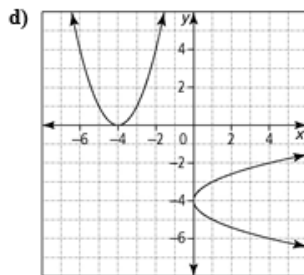
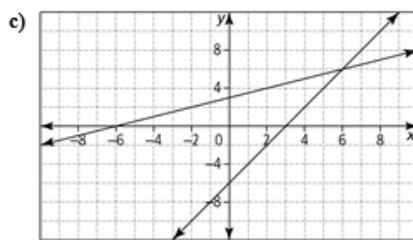
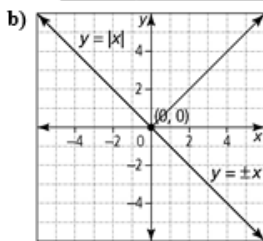
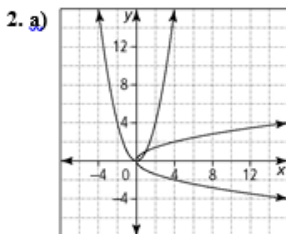


BLM 1-5 Section 1.4 Extra Practice

1. a) interchange the x-coordinate and y-coordinate of the graph or equation

b) $x = f^{-1}(y)$ or $y = f(x)$

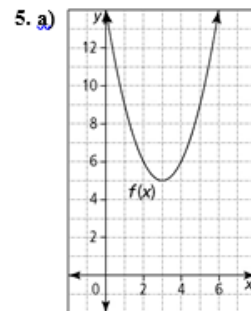
c) $(x, y) \rightarrow (y, x)$



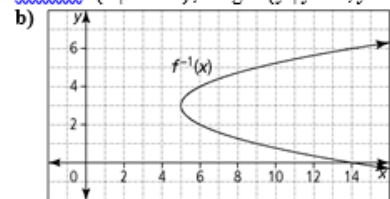
3. a) The inverse of a), b), and d) are not functions. A vertical line intersects the graph of the inverse at more than one point. This means that the relation is not a function.

4. a) $f^{-1}(x) = \frac{1}{3}x + 2$ b) $f^{-1}(x) = 2x - 10$

c) $f^{-1}(x) = 3x - 12$ d) $f^{-1}(x) = \frac{1}{2}x - \frac{3}{2}$



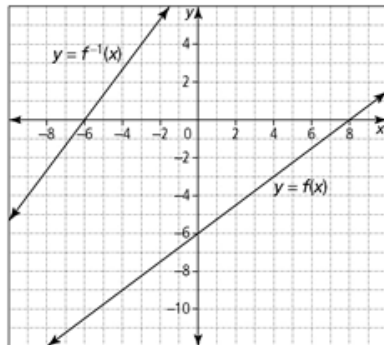
domain: $\{x \mid x \in \mathbb{R}\}$; range: $\{y \mid y \geq 5, y \in \mathbb{R}\}$



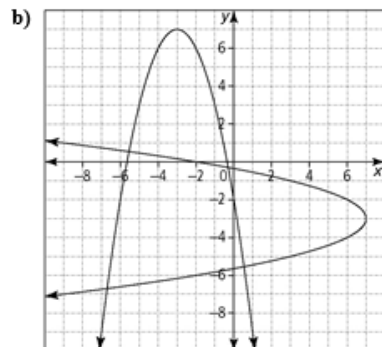
domain: $\{x \mid x \geq 5, x \in \mathbb{R}\}$; range: $\{y \mid y \in \mathbb{R}\}$

c) Restrict the domain to $\{x \mid x \geq 3, x \in \mathbb{R}\}$ or $\{x \mid x \leq 3, x \in \mathbb{R}\}$.

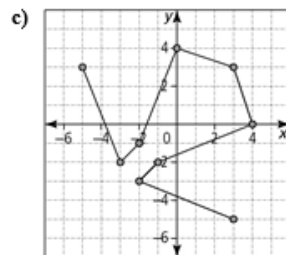
6. a) $f^{-1}(x) = \pm\sqrt{x} - 4$ b) $f^{-1}(x) = \pm\sqrt{x+7}$
 c) $f^{-1}(x) = \pm\sqrt{x-5} + 2$ d) $f^{-1}(x) = \pm\sqrt{x+9} + 5$
 7. a) $x \geq 0$ or $x \leq 0$ b) $x \geq -4$ or $x \leq -4$
 c) $x \geq 3$ or $x \leq 3$ d) $x \geq 0$ or $x \leq 0$
 8. a) 12 b) 6 c) 16 d) 8
 9. a)



The inverse is a function.



The inverse is not a function.



The inverse is not a function.

Changing equation of parabolas to inverse equation.

$$1. y = 2(x+5)^2 - 7$$

$$x = 2(y+5)^2 - 7$$

$$x+7 = 2(y+5)^2$$

$$\frac{x+7}{2} = (y+5)^2$$

$$\pm \sqrt{\frac{x+7}{2}} = y+5$$

$$-5 \pm \sqrt{\frac{x+7}{2}} = y^{-1}$$

$$2. y = -\frac{2}{3}(x-1)^2 - 6$$

$$x = -\frac{2}{3}(y-1)^2 - 6$$

$$x+6 = -\frac{2}{3}(y-1)^2$$

$$-\frac{3}{2}(x+6) = (y-1)^2$$

$$\pm \sqrt{-\frac{3}{2}(x+6)} = y-1$$

$$1 \pm \sqrt{-\frac{3}{2}(x+6)} = y^{-1}$$

or

$$1 \pm \sqrt{-\frac{3}{2}x-9} = y^{-1}$$

3. $y = x^2 - 6x + 5$

* change to vertex form

$$y = a(x-p)^2 + q$$

Option 1
complete the square

$$y = (x^2 - 6x) + 5$$

$$y = (x^2 - 6x + 9) + 5 - 9$$

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

Option 2
find vertex by $-\frac{b}{2a}$

$$-\frac{b}{2a} = \frac{6}{2(1)} = 3$$

$$y = (3)^2 - 6(3) + 5 = -4$$

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

then

$$y^{-1} = 3 \pm \sqrt{x+4}$$

4. $y = 2x^2 + 20x + 1$

$$y = a(x-p)^2 + q$$

complete the square

$$y = (2x^2 + 20x) + 1$$

$$y = 2(x^2 + 10x + 25) + 1 - 50$$

$$y = 2(x + 5)^2 - 49$$

$$-\frac{b}{2a} = \frac{-20}{4} = -5$$

$$y = 2(-5)^2 + 20(-5) + 1$$

$$= -49 \quad \text{vertex}(-5, -49)$$

* Don't forget 'a' = 2

$$y = 2(x + 5)^2 - 49$$

$$y^{-1} = -5 \pm \sqrt{\frac{1}{2}(x+49)}$$