

Review: Transformations

Date: _____

1) Determine the domain and range of the following functions

a) $y = x^2$

b) $y = \sqrt{x}$

c) $y = \frac{1}{x-2}$

d) $y = 2 - 3x$

e) $y = x^3 + 3$

f) $y = \sqrt{x-1}$

g) $y = \frac{x}{2+x}$

h) $y = |2x+3| - 5$

2) Given $f(x) = x^2 + 1$, determine the equation of each of the following:

a) $f(5)$

b) $f(x)+3$

c) $f(x+3)$

d) $f(x-2)$

3) If $f(x) = \sqrt{x}$ and $g(x) = x^2 + 9$, find a) $g(-4) - f(9)$ b) $f(g(x))$, c) $g(f(x))$, d) $g(g(x))$

4) Sketch and state the values of a, k, p and q the following relations.

a) $y = 2|x-4| + 3$

b) $y = -\sqrt{-(x+3)}$

c) $y = \frac{-1}{x+4}$

d) $y = \sqrt{4x} - 3$

e) $y = (x-2)^2 + 3$

f) $y = -3|x+1|$

g) $y = 4|x|$

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

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

j) $y = -3\sqrt{2(x-1)} + 1$

k) $y = 2\sqrt{4x-8} + 3$

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

5) Find and sketch the inverse of each function, and state whether the inverse is also a function.

a) $f(x) = 2x + 3$

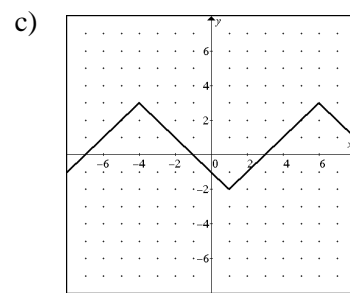
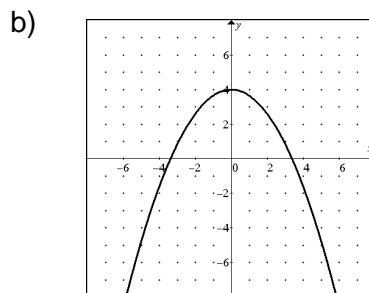
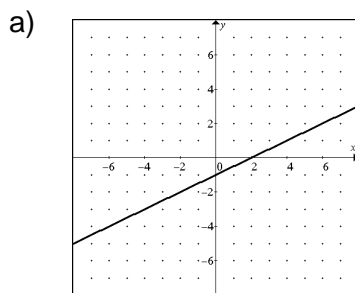
b) $g(x) = 2x^2 - 3$

c) $h(x) = \frac{1}{x+1}$

d) $f(x) = (x+1)^2$

e) $y = \sqrt{x-2}$

6) For each of the following, sketch the reciprocal of the given graph.



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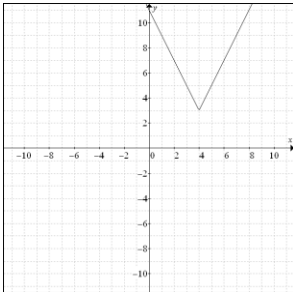
Answers

- 1a) $x \in R, y \geq 0$ b) $x \geq 0, y \geq 0$ c) $x \neq 2, y \neq 0$ d) $x \in R, y \in R$ e) $x \in R, y \in R$ f) $x \geq 1, y \geq 0$
 g) $x \neq -2, y \neq 1$ h) $x \in R, y \geq 5$

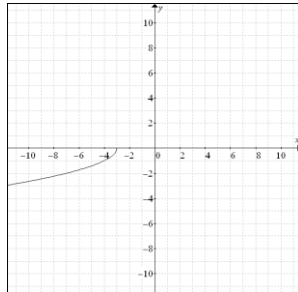
- 2a) 26 b) $x^2 + 4$ c) $x^2 + 6x + 10$ d) $x^2 - 4x + 5$ 3a) 22 b) $\sqrt{x^2 + 9}$ c) $x + 9$ d) $x^4 + 18x^2 + 90$

- 4a) 2,1,4,3 b) -1,-1,-3,0 c) -1,1,-4,0 d) 2,1,0,-3 e) 1,1,2,3 f) -3,1,-1,0 g) 4,1,0,0 h) 1,1,3,3
 i) -1,1,-4,2 j) -3,2,1,1 k) 4,1,2,3 l) -1,1,-3,-2

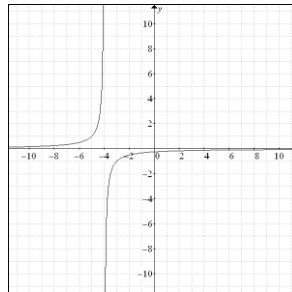
a)



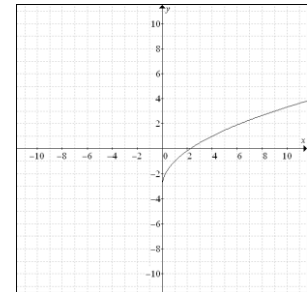
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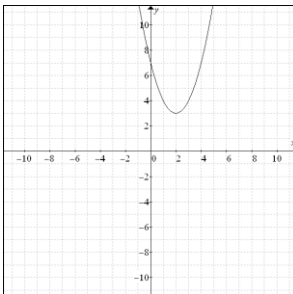
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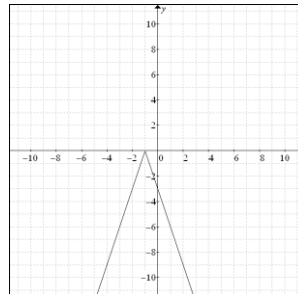
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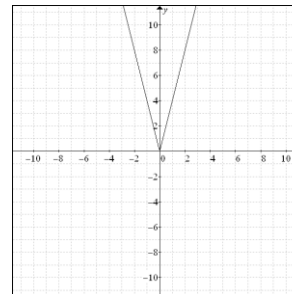
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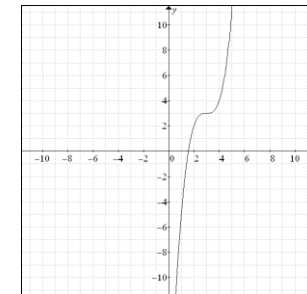
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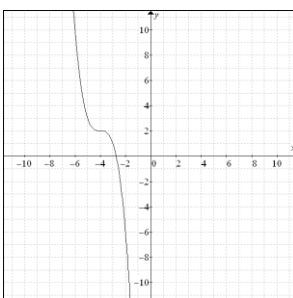
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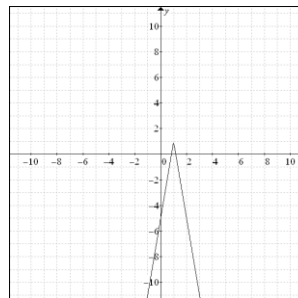
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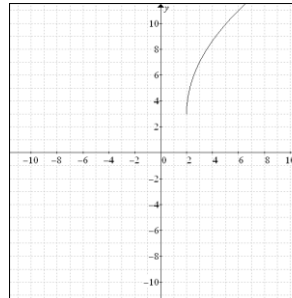
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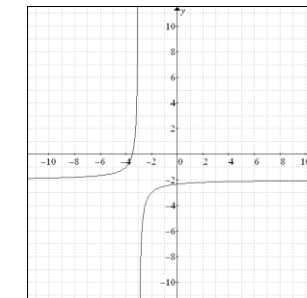
j)



k)

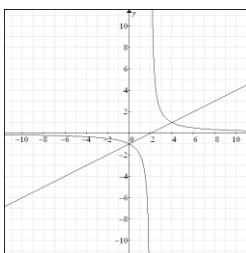


l)

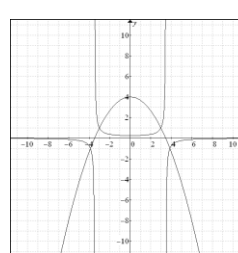


- 5a) $f^{-1} = \frac{x-3}{2}$ b) $g^{-1} = \pm\sqrt{\frac{x+3}{2}}$ c) $h^{-1} = \frac{1}{x} - 1$ d) $f^{-1} = \pm\sqrt{x+1}$ e) $y^{-1} = x^2 + 2$

6a)



b)



c)

