

6.5-6.8 Review

Find the inverse of each function.

1)  $h(n) = 2n + 5$   
 $y = 2x + 5$   
 $x = 2y + 5$   
 $x - 5 = 2y$   
 $\frac{x - 5}{2} = y$

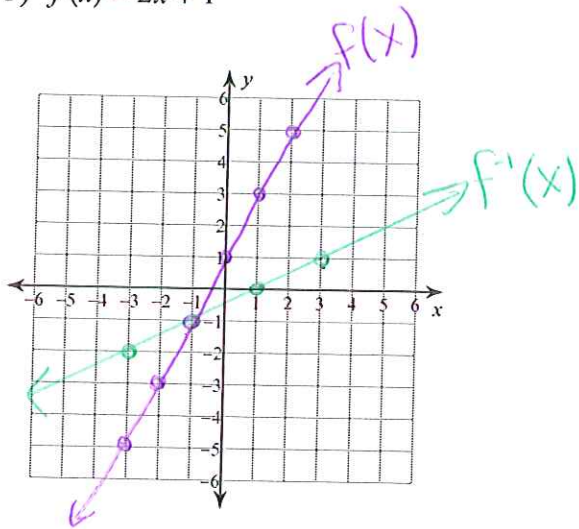
$h^{-1}(n) = \frac{n - 5}{2}$

2)  $f(n) = (n - 2)^3 - 1$   
 $n = (y - 2)^3 - 1$   
 $n + 1 = (y - 2)^3$   
 $\sqrt[3]{n + 1} = y - 2$   
 $\sqrt[3]{n + 1} + 2 = y$

$f^{-1}(n) = \sqrt[3]{n + 1} + 2$

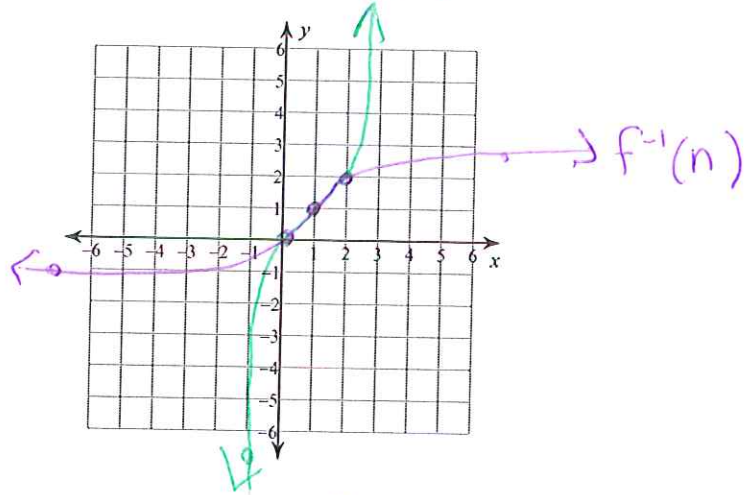
Graph the function and its inverse. Is the inverse a function?

3)  $f(x) = 2x + 1$



Both are functions

4)  $f(n) = (n - 1)^3 + 1$

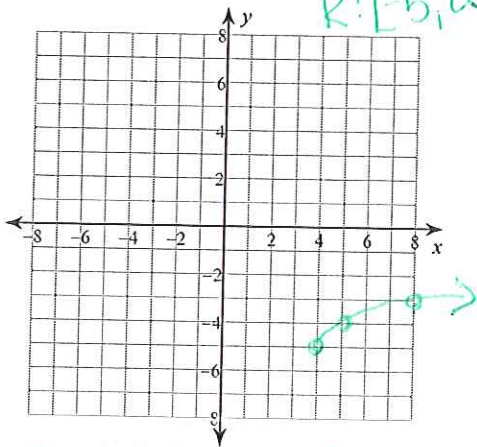


Both are functions

State the transformations of the parent function. Identify the domain and range of each. Then sketch the graph.

5)  $y = \sqrt{x - 4} - 5$

$D: [4, \infty)$   
 $R: [-5, \infty)$

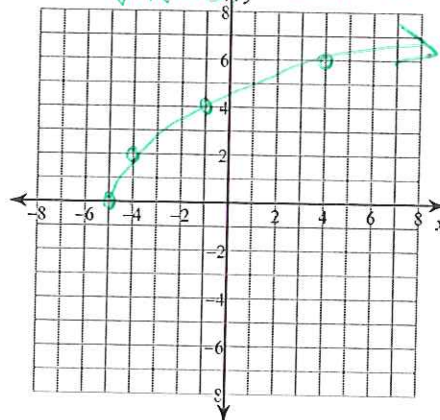


Shift right 4  
 Shift down 5

6)  $y = \sqrt{4x + 20}$

$\sqrt{4(x + 5)} = 2\sqrt{x + 5}$

stretch bfo 2  
 shift left 5



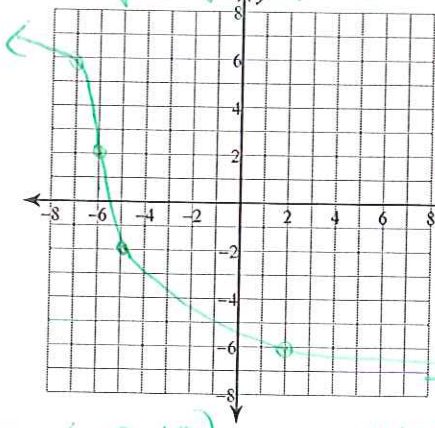
$D: [-5, \infty)$   
 $R: [0, \infty)$

Describe the transformations of the parent function. Sketch the graph of each function. Then state the domain and the range.

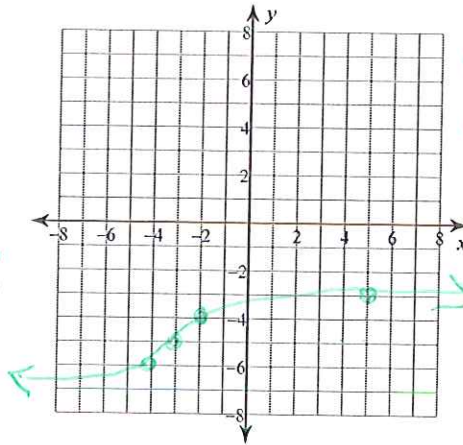
7)  $y = \sqrt[3]{-64x - 384} + 2$   
 $\sqrt[3]{-64(x+6)} + 2$

$-4\sqrt[3]{x+6} + 2$

8)  $y = \sqrt[3]{x+3} - 5$



Reflect over X-axis  
 Shift left 6  
 Shift up 2  
 Stretch bfo 4



Shift left 3  
 Shift down 5

D:  $\mathbb{R}$   
 R:  $\mathbb{R}$

D:  $(-\infty, \infty)$   
 R:  $(-\infty, \infty)$

over 1 up 1 (-4)  
 over 8 up 2 (-4)

Solve each equation.

9)  $(3a + 61)^{\frac{2}{3}} = 8$

$3a + 61 = \sqrt[3]{8}^{\frac{3}{2}}$

$3a + 61 = 4$

$3a = -57$

$a = -19$

Solve each equation. Remember to check for extraneous solutions.

10)  $\sqrt{\frac{b}{4}} = 4$

$\frac{b}{4} = 16$

$b = 64$

11)  $\sqrt{3n+14} = \sqrt{2n+12}$

$3n+14 = 2n+12$

$n = -2$

$$12) \sqrt{30-a} = a^2$$

$$30-a = a^2$$

$$0 = a^2 + a - 30$$

$$0 = (a+6)(a-5)$$

$$a = -6, 5$$

$$\boxed{a = 5}$$

$$13) (x-9)^2 = \sqrt{21-2x}$$

$$(x-9)(x-9) = 21-2x$$

$$x^2 - 18x + 81 = 21 - 2x$$

$$x^2 - 16x + 60 = 0$$

$$(x-10)(x-6) = 0$$

$$x = 10, 6$$

$$\boxed{x = 10}$$

Perform the indicated operation.

$$14) f(a) = -2a - 2$$

$$g(a) = a + 2$$

Find  $(f-g)(a)$

$$(-2a-2) - (a+2)$$

$$(f-g)(a) = 3a-4$$

$$D: \mathbb{R}$$

$$15) h(n) = 4n + 5$$

$$g(n) = n^2 - 2$$

Find  $(5h+2g)(n)$

$$5(4n+5) + 2(n^2-2)$$

$$20n + 25 + 2n^2 - 4$$

$$\boxed{(5h+2g)(n) = 2n^2 + 20n + 21}$$

$$D: \mathbb{R}$$

$$16) f(a) = a - 3$$

$$g(a) = 3a + 2$$

Find  $(f \circ g)(-8)$

$$g(-8) = 3(-8) + 2 = -22$$

$$f(-22) = -22 - 3 = -25$$

Simplify. Your answer should contain only positive exponents.

$$18) (2m^3n^2)^4 \cdot 2m^{-1}n^{-4}$$

$$\frac{16m^{12}n^8 \cdot 2}{mn^4}$$

$$\boxed{32m^{11}n^4}$$

$$17) h(a) = -2a$$

$$g(a) = a^2 - 4a$$

Find  $\left(\frac{h}{g}\right)(a)$

$$\frac{-2a}{a^2-4a} = \frac{-2a}{a(a-4)}$$

$$\left(\frac{h}{g}\right)(a) = \frac{-2}{a-4}$$

$$D: a \neq 0, 4$$

$$19) \frac{4x^{-2}y^{-4}}{4x^4y^3 \cdot 4x^{-1}y^{-1}}$$

$$\frac{x^{-2}y^{-4}}{16x^3y^2}$$

$$\boxed{\frac{1}{16x^5y^6}}$$

$$20) \frac{(y^{-3})^2}{y^3} = \frac{y^{-6}}{y^3} = \frac{1}{y^9}$$

Simplify.

$$21) -4\sqrt[4]{20x^3y^2z^4} \cdot \sqrt[4]{20x^2yz^4}$$

$$-4\sqrt[4]{400x^5y^3z^8} = \sqrt[4]{16} \sqrt[4]{25} \sqrt[4]{x^5y^3z^8}$$

$$-4 \sqrt[4]{25xy^3z^8} = \sqrt[4]{25xy^3z^8}$$

$$22) 4\sqrt{20a^3b} \cdot 4\sqrt{20ab^6}$$

$$16\sqrt{400a^4b^7} = 320a^2b^3\sqrt{b}$$

$$23) -\sqrt{45} - 2\sqrt{45} + 2\sqrt{18}$$

$$-3\sqrt{5} - 6\sqrt{5} + 6\sqrt{2}$$

$$-9\sqrt{5} + 6\sqrt{2}$$

$$24) -\sqrt{27} - 3\sqrt{12} + 2\sqrt{18}$$

$$-3\sqrt{3} - 6\sqrt{3} + 6\sqrt{2}$$

$$-9\sqrt{3} + 6\sqrt{2}$$

$$25) \sqrt{6}(5 - 4\sqrt{3})$$

$$5\sqrt{6} - 4\sqrt{18} = 5\sqrt{6} - 12\sqrt{2}$$

$$26) (\sqrt{2} - 3)(\sqrt{2} - 4)$$

$$\sqrt{4} - 4\sqrt{2} - 3\sqrt{2} + 12$$

$$2 - 7\sqrt{2} + 12$$

$$14 - 7\sqrt{2}$$

$$27) (343x^9)^3$$

$$\sqrt[3]{343x^9} = 7x^3$$

Write each expression in radical form.

$$28) (3x)^{\frac{8}{5}} = \sqrt[5]{(3x)^8}$$

Write each expression in exponential form.

$$29) \sqrt[5]{2x} = (2x)^{\frac{1}{5}}$$

Simplify.

$$30) \frac{3\sqrt[4]{2}}{\sqrt{25}} \cdot \frac{\sqrt[4]{25}}{\sqrt[4]{25}} = \frac{3\sqrt[4]{50}}{\sqrt[4]{625}}$$

$$31) (49n^2)^{\frac{1}{2}} = \sqrt{49n^2} = 7n$$

$$32) \frac{5\sqrt{2}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{6}}{3}$$

$$33) \frac{2\sqrt{5}}{3\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{10}}{3\sqrt{4}} = \frac{2\sqrt{10}}{6} = \frac{\sqrt{10}}{3}$$

$$34) \frac{-2}{4\sqrt[3]{2}} \cdot \frac{\sqrt[3]{4}}{\sqrt[3]{4}} = \frac{-2\sqrt[3]{4}}{4\sqrt[3]{8}}$$

$$\frac{-2\sqrt[3]{4}}{4\sqrt[3]{8}} = \frac{-2\sqrt[3]{4}}{8} = \frac{-\sqrt[3]{4}}{4}$$