

Inverse of Functions HOMEWORK

Find the inverse of each function.

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

$$y = 2x^3 + 3$$

$$x = 2y^3 + 3$$

$$x - 3 = 2y^3$$

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

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

3) $f(x) = \sqrt[5]{x+2} + 1$

$$y = \sqrt[5]{x+2} + 1$$

$$x = \sqrt[5]{y+2} + 1$$

$$x - 1 = \sqrt[5]{y+2}$$

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

$$f^{-1}(x) = y = (x-1)^5 - 2$$

5) $h(x) = 3x + 12$

$$y = 3x + 12$$

$$x = 3y + 12$$

$$x - 12 = 3y$$

$$f^{-1}(x) = y = \frac{x-12}{3}$$

7) $g(x) = \sqrt[3]{x} - 3$

$$y = \sqrt[3]{x} - 3$$

$$x = \sqrt[3]{y} - 3$$

$$x + 3 = \sqrt[3]{y}$$

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

2) $f(n) = \frac{-n-1}{3}$

$$y = \frac{-x-1}{3}$$

$$x = \frac{-y-1}{3}$$

$$3x = -y - 1$$

$$-y = 3x + 1$$

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

4) $g(n) = (n-2)^5 + 1$

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

$$x - 1 = (y-2)^5$$

$$\sqrt[5]{x-1} = y-2$$

$$f^{-1}(x) = y = \sqrt[5]{x-1} + 2$$

6) $f(x) = (x+1)^3$

$$y = (x+1)^3$$

$$x = (y+1)^3$$

$$\sqrt[3]{x} = y+1$$

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

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

$$y = \sqrt[3]{x+2} - 1$$

$$x = \sqrt[3]{y+2} - 1$$

$$x + 1 = \sqrt[3]{y+2}$$

$$(x+1)^3 = y+2$$

$$f^{-1}(x) = y = (x+1)^3 - 2$$