F.BF.B.4: Inverse of Functions 3

1 For the function $d(x) = \sqrt[3]{x+2}$, the inverse function, $d^{-1}(x)$, equals

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

  2) $x^3 + 2$ 4) $x^3 - 2$

2 If $f(x) = \sqrt[3]{x} + 4$, then $f^{-1}(x)$ equals

  1) $\sqrt[3]{x-4}$ 3) $x^3 + \dfrac{1}{4}$

  2) $(x-4)^3$ 4) $-\sqrt[3]{x} - 4$

3 Given $f(x) = x^3 - 3$ and $f^{-1}(x) = \sqrt[3]{x-3b}$, the value of b is

  1) 1   3) 3

  2) −1   4) −3

4 What is the inverse of $f(x) = x^3 - 2$?

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

  2) $f^{-1}(x) = \pm\sqrt[3]{x} + 2$ 4) $f^{-1}(x) = \pm\sqrt[3]{x+2}$

5 For the function $f(x) = (x-3)^3 + 1$, find $f^{-1}(x)$.

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Answer Section

1 ANS: 4

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

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

$$x^3 = y+2$$

$$y = x^3 - 2$$

REF: 062419aii

2 ANS: 2

$$y = \sqrt[3]{x} + 4$$

$$x = \sqrt[3]{y} + 4$$

$$x - 4 = \sqrt[3]{y}$$

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

REF: 012519aii

3 ANS: 2

$$y = x^3 - 3$$

$$x = y^3 - 3$$

$$x + 3 = y^3$$

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

REF: 012419aii

4 ANS: 3

$$y = x^3 - 2$$

$$x = y^3 - 2$$

$$x + 2 = y^3$$

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

REF: 061815aii

5 ANS:

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

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

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

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

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

REF: fall1509aii