1.7 Practice Name: Key

Determine whether *f* has an inverse function. If it does, find the inverse function and state any restrictions on its domain.

1. $f(x) = 3x - 1$ Passes D: $(-\infty, \infty)$ R: $(-\infty, \infty)$

$x = 3y - 1$

$3y = x + 1$

$y = \frac{x}{3} + \frac{1}{3}$ D: $(-\infty, \infty)$

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

Fails!

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

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

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

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

$y = \sqrt[3]{x-2} + 1$ D: $(-\infty, \infty)$

4. $f(x) = 4\sqrt{x} + 2$ D: $[0, \infty)$ R: $[2, \infty)$

Passes!

$x = 4\sqrt{y} + 2$

$4\sqrt{y} = x - 2$

$(\sqrt{y})^2 = \left(\frac{x-2}{4}\right)^2$

$y = \frac{x^2 - 4x + 4}{16}$ D: $[2, \infty)$

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

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

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

$f \circ g$

$$\frac{\left(\sqrt{2x+12}\right)^2}{2} - 6$$

$$\frac{2(x+6)}{2} - 6$$

$$x + 6 - 6$$

x

$g \circ f$

$$\sqrt{2\left(\frac{x^2}{2} - 6\right) + 12}$$

$$\sqrt{x^2 - 12 + 12}$$

$$\sqrt{x^2}$$

x