

P.58 (11)

5-25 odd
35-38 < 11

$$f(x) = \frac{1}{x^2} \cdot x = \frac{1}{x}$$

$$g(x) = \frac{1}{x^2}$$

a. $\frac{x}{x^2} + \frac{1}{x^2} = \frac{x+1}{x^2}$

b. $\frac{x-1}{y^2}$

c. $\frac{1}{x} \cdot \frac{1}{x^2} = \frac{1}{x^3}$

d. $\frac{\frac{x-1}{x^2} \cdot \frac{1}{x^2}}{\frac{x-1}{x^2} \cdot \frac{1}{x^2}} = \frac{x-1}{x^2} \cdot \frac{x^2}{x-1} = x$

$\frac{2 \cdot 2}{3 \cdot 2} = \frac{4}{6}$

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1-6 Inverse Functions

Ex 1 Find the inverse of $f(x) = \frac{4x-1}{3}$

$y = \frac{4x-1}{3}$

1. switch $x \leftrightarrow y$
2. solve for y

1. $x = \frac{4y-1}{3}$

2. $3x = 4y-1$
 $3x+1 = 4y$
 $y = \frac{3x+1}{4}$

$f^{-1}(x) = \frac{3x+1}{4}$

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Ex 2 Verify that $f^{-1}(x) = \frac{3x+1}{4}$ is the inverse of $f(x) = \frac{4x-1}{3}$

$\frac{4x-1}{3}$

$f(f^{-1}(x)) = x$

$\frac{4(\frac{3x+1}{4})-1}{3} = x$

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Ex 3 Find the inverse of $f(x) = 3x-5$ and verify that it is the inverse.

$y = 3x-5$
 $x = 3y-5$
 $x+5 = 3y$
 $y = \frac{x+5}{3}$

$f^{-1}(x) = \frac{x+5}{3}$

$3(\frac{x+5}{3}) - 5 = x$

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Ex 4 Graph the function and its inverse

$f(x) = 3x-5$
 $f^{-1}(x) = \frac{x+5}{3}$

$y = \frac{x}{3} + \frac{5}{3}$
 $y = \frac{1}{3}x + \frac{5}{3}$

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Ex 5 Does this function have an inverse function? **NO**

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Ex 6 Find the inverse

$$f(x) = \sqrt{x-2}$$

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

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

$$x^2 = y-2$$

$$x^2 + 2 = y$$

$$f^{-1}(y) = x^2 + 2, x \geq 0$$

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Calculus Idea:
 The two main functions that are used in calculus are inverse operations.

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Homework
 p.69
 #1-27 odds

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