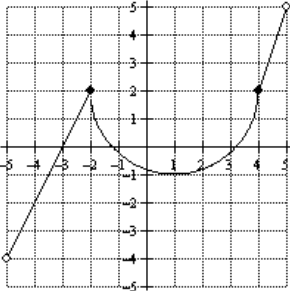
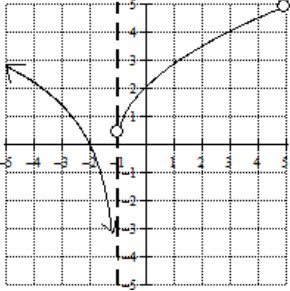
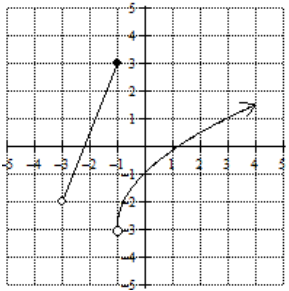
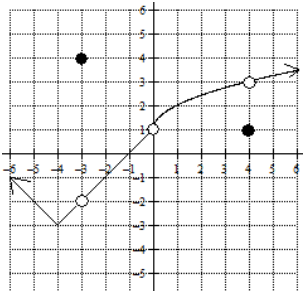


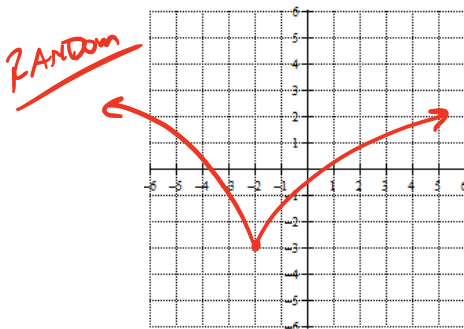
### Homework 1.5

On questions 1 – 4, give the domain and range of each graphed function using interval notation.

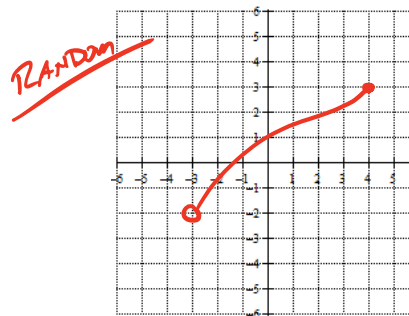
<p>1.</p>  <p>Domain: <math>(-5, 5)</math></p> <p>Range: <math>(-4, 5)</math></p>	<p>2.</p>  <p>Domain: <math>(-\infty, -1) \cup (-1, 5)</math></p> <p>Range: <math>(-\infty, \infty)</math></p>	<p>3.</p>  <p>Domain: <math>(-3, \infty)</math></p> <p>Range: <math>(-3, \infty)</math></p>	<p>4.</p>  <p>Domain: <math>(-\infty, 0) \cup (0, \infty)</math></p> <p>Range: <math>[-3, \infty)</math></p>
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For problems 5 – 6, sketch a graph with the given domain and range.

5. Domain:  $(-\infty, \infty)$  Range:  $[-3, \infty)$



6. Domain:  $(-3, 4]$  Range:  $(-2, 3]$



For questions 7 – 10, find the given function value. Then, based on the result, determine if the x – value is a value in the domain of the function. Give a reason for your answer and show your work.

$$f(x) = \frac{x^2 - 2x - 15}{x^2 - 25}$$

$$g(x) = \sqrt{x^2 - x - 2}$$

7.  $g(0) = \sqrt{(0)^2 - (0) - 2}$

$= \sqrt{-2}$

$\therefore g(0)$  is undefined

$x=0$  is not in the domain of  $g(x)$  because when  $x=0$ ,  $g(x)$  has no  $y$ -value.

8.  $f(5) = \frac{(5)^2 - 2(5) - 15}{(5)^2 - 25} = \frac{25 - 10 - 15}{25 - 25} = \frac{0}{0}$

$\therefore f(5)$  is undefined

$x=5$  is not in the domain of  $f(x)$  b/c when  $x=5$ ,  $f(x)$  has no  $y$ -value.

<p>9. <math>f(-3) = \frac{(-3)^2 - 2(-3) - 15}{(-3)^2 - 25} = \frac{9+6-15}{9-25} = \frac{0}{-16} = 0</math></p> <p><math>x = -3</math> is in the domain of <math>f(x)</math> b/c</p> <p>when <math>x = -3, y = 0</math>.</p>	<p>10. <math>g(4) = \sqrt{(4)^2 - (4) - 2}</math></p> <p><math>= \sqrt{16-6}</math></p> <p><math>= \sqrt{10} \approx 3.162</math></p> <p><math>x = 4</math> is in the domain of <math>g(x)</math> b/c</p> <p>when <math>x = 4, y = \sqrt{10}</math>.</p>
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For problems 11 – 19, determine the domain of the given function. Leave your answers in interval notation. Show your work or explain how you arrived at your answer.

<p>11. <math>f(x) = \sqrt[3]{3-3x}</math></p> <p>D: <math>(-\infty, \infty)</math></p> <p>(b/c cubic root function)</p>	<p>12. <math>f(x) = 3x^2 - 2x + 3</math></p> <p>D: <math>(-\infty, \infty)</math></p> <p>(b/c QUADRATIC function)</p>	<p>13. <math>f(x) = \sqrt{3-2x} - 4</math></p> <p>RADICAND <math>\geq 0</math></p> <p><math>3-2x \geq 0</math></p> <p><math>-2x \geq -3</math></p> <p><math>x \leq 3/2</math></p> <p>D: <math>(-\infty, 3/2]</math></p>
<p>14. <math>f(x) = \sqrt{x-2}</math></p> <p>RADICAND <math>\geq 0</math></p> <p><math>x-2 \geq 0</math></p> <p><math>x \geq 2</math></p> <p>D: <math>[2, \infty)</math></p>	<p>15. <math>h(x) = \sqrt[3]{\frac{x+3}{3-7x}}</math></p> <p><u>Denom <math>\neq 0</math></u></p> <p><math>3-7x \neq 0</math></p> <p><math>3 \neq 7x</math></p> <p><math>\frac{3}{7} \neq x</math></p> <p>D: <math>(-\infty, \frac{3}{7}) \cup (\frac{3}{7}, \infty)</math></p> <p>OR</p> <p>D: <math>\mathbb{R}, x \neq \frac{3}{7}</math></p>	<p>16. <math>p(x) = \frac{2-3x}{x^2-9}</math></p> <p><u>Denom <math>\neq 0</math></u></p> <p><math>x^2-9 \neq 0</math></p> <p><math>x^2 = 9</math></p> <p><math>x = \pm 3</math></p> <p>D: <math>(-\infty, -3) \cup (-3, 3) \cup (3, \infty)</math></p> <p>OR</p> <p>D: <math>\mathbb{R}, x \neq \pm 3</math></p>
<p>17. <math>q(x) = \frac{x+2}{x^2-3x-10}</math></p> <p><u>Denom <math>\neq 0</math></u></p> <p><math>(x-5)(x+2) \neq 0</math></p> <p><math>x-5 \neq 0 \quad \left. \begin{array}{l} x+2 \neq 0 \\ x \neq -2 \end{array} \right\} x \neq -2</math></p> <p><math>x \neq 5</math></p> <p>D: <math>(-\infty, -2) \cup (-2, 5) \cup (5, \infty)</math></p> <p>D: <math>\mathbb{R}, x \neq -2, 5</math></p>	<p>18. <math>f(x) = \frac{x+2}{2x^3-8x}</math></p> <p><u>Denom <math>\neq 0</math></u></p> <p><math>2x(x^2-4) \neq 0</math></p> <p><math>2x(x-2)(x+2) \neq 0</math></p> <p><math>2x \neq 0 \quad \left. \begin{array}{l} x-2 \neq 0 \\ x+2 \neq 0 \end{array} \right\} \begin{array}{l} x \neq 0 \\ x \neq 2 \\ x \neq -2 \end{array}</math></p> <p>D: <math>(-\infty, -2) \cup (-2, 0) \cup (0, 2) \cup (2, \infty)</math></p> <p>D: <math>\mathbb{R}, x \neq -2, 0</math></p>	<p>19. <math>f(x) = \frac{3x}{3x^2+x-10}</math></p> <p><u>Denom <math>\neq 0</math></u></p> <p><math>(3x-5)(x+2) \neq 0</math></p> <p><math>3x-5 \neq 0 \quad \left. \begin{array}{l} x+2 \neq 0 \\ 3x \neq 5 \\ x \neq 5/3 \end{array} \right\} \begin{array}{l} x \neq -2 \\ x \neq -2 \\ x \neq 5/3 \end{array}</math></p> <p>D: <math>(-\infty, -2) \cup (-2, 5/3) \cup (5/3, \infty)</math></p> <p>D: <math>\mathbb{R}, x \neq -2, 5/3</math></p>