

1) Solve:  $7x - 3 = 12$

$$\frac{15}{7}$$

2) Solve by factoring:  $x^2 - 7x + 12 = 0$

$$(x - 4)(x - 3) = 0$$

$$x = 4, 3$$

3) Solve by any method:  $x^2 + 8x + 16 = -5$

HINT: This is easiest to solve by completing the square.

$$(x + 4)^2 = -5$$

$$x + 4 = \pm i\sqrt{5}$$

$$x = -4 \pm i\sqrt{5}$$

4) Solve using the quadratic formula:  $2x^2 - 2x - 5 = 0$

$$x = \frac{2 \pm \sqrt{44}}{4}$$

5) Solve:  $3x + 7 = 25$

$$x = 6$$

Solve:

6)  $|2x - 7| = 13$

$$x = 10, -3$$

7)  $-12 \leq 3x + 2 \leq 10$

$$\frac{-14}{3} \leq x \leq \frac{8}{3}$$

8)  $|x + 5| \leq 20$

$$-25 \leq x \leq 15$$

9)  $x^2 = 100$

$$x = \pm 10$$

10)  $3x + 1 > 7x - 8$

$$x < \frac{9}{4}$$

11) Simplify to  $a + bi$  form.  $(5 - 3i)(5 + 3i)$

$$34$$

12) Simplify to  $a + bi$  form.  $\frac{2}{5+3i}$

$$\frac{2(5-3i)}{(5+3i)(5-3i)} = \frac{10-6i}{34} = \frac{5}{17} - \frac{3}{17}i$$

The length of a rectangular field is 30 feet longer than its width, and the area of the field is 7,000 square feet.

13) Draw a representative sketch of this field and label the dimensions using one variable.

*Draw a rectangle, one side  $W$ , and the other side  $L = W + 30$ .*

14) Express the area (7,000 square feet) as a product of the length and the width using numbers and one variable.

$$W(W + 30) = 7000$$

15) Solve the equation, then state the field's dimensions using a grammatically correct English sentence.

$$W^2 + 30W - 7000 = 0$$

$$W = 70, L = 100$$

16) What is the domain of  $f(x) = \frac{x^2+5}{\sqrt{3x-1}}$  ?

$$3x - 1 > 0$$

$$x > \frac{1}{3}$$

17) Find the equation of the line through the points (5, 1) and (-3, 25).

$$m = \frac{25-1}{-3-5} = -3$$

$$y = -3(x - 5) + 1$$

18) Find the equation of the vertical line through the point (7, 9).

$$x = 7$$

19) Find the slope and y-axis intercept of the line  $5y - 3x - 17 = 0$ .

Solve for y.

$$y = \frac{3}{5}x + \frac{17}{5}$$

$$m = \frac{3}{5}, b = \frac{17}{5}$$

20) Find the equation of the line through (2, 3) parallel to the x-axis.

$$y = 3$$

21) Find the equation of the line through (4, 2) perpendicular to the line  $2y + x + 43 = 0$ .

Solve for y.

$$y = \frac{-1}{2}x - \frac{43}{2}$$

$m = \frac{-1}{2}$ , so the perpendicular slope is the negative reciprocal of  $\frac{-1}{2}$  which is 2.

Use the point (4,2) and  $m=2$ :  $y = 2(x - 4) + 2$

Consider the functions  $f(x) = 5x - 2$ ,  $g(x) = x^2$

22) Find  $g(f(4))$ .

$$f(4) = 5 \cdot 4 - 2 = 18$$

$$g(f(4)) = g(18) = 18^2 = 324$$

23) Find  $f^{-1}(x)$

$$f^{-1}(x) = \frac{x+2}{5}$$