

1. Solve for x if:

- $5x + 1 = 7x - 3$
- $3x + 4 = 3(3x - 1)$
- $5x + 6 \leq -2$
- $|x - 2| = 20$
- $|x - 2| \leq 20$

2. Solve for x if:

- $(x + 3)(3x - 5) = 0$
- $x^2 - 5x + 6 = 0$
- $x^2 + 5x + 6 = 0$

3. Sketch:

- $y = f(x) = 2x - 3$
- $y = f(x) = x^2 - 5x + 6$

c. The area of a square is 16 square inches less than the area of a rectangle whose dimensions are 5 inches by 38 inches. What is the length of the side of the square?

4. a. Jane is three times as old as John. In 4 years she will be only twice as old as he is. How old will Jane be in 4 years?

b. Jane has twice the number of bananas as John has. If She and John each eat 10 bananas, she will have 3 times as many as John will have. How many bananas did John start with?

c. The sum of two numbers is 21. Their difference is 9. What are the two numbers?

5. A line goes through the points (5 , 10) and ( 6, - 3 ).

- What is the slope of the line?
- What is the equation of the line?
- What is the slope of a line parallel to this line?
- Write the equation of a line perpendicular to the original line.

6. Factor completely:

a.  $\frac{x(x^2 - 3x - 4)}{x^2}$

b.  $8x^2 + 24x - 4$

c.  $\frac{x^5 - 3x^2 - 14x}{x}$

7. a. A square is 1 kilometer in length on its side. How long is the diagonal of the square?

b. How many square meters are in a square 1 kilometer on each side?

8. Simplify:

a.  $(\frac{1}{2})^2$

b.  $3^{-2} + 2^{-3}$

c.  $\frac{2x}{2x-3} + \frac{x}{x-1}$

9. a. Sketch:  $y = 3^{-x}$

b. If  $y = f(x) = \log x$ , find the following values:

i.  $f(10)$

ii.  $f(1/10)$

iii.  $f(-10)$

c. Sketch:  $y = f(x) = -\log_2 x$

10. Solve for x:

a.  $5 = \log_3 x$

b.  $3^x = 81$

c.  $2 = \log_x 2$

d.  $3^{x+2} = 27$