

## Algebra Practice Problems for Precalculus and Calculus

Solve the following equations for the unknown  $x$ :

1.  $5 = 7x - 16$
2.  $2x - 3 = 5 - x$
3.  $\frac{1}{2}(x - 3) + x = 17 + 3(4 - x)$
4.  $\frac{5}{x} = \frac{2}{x-3}$

Multiply the indicated polynomials and simplify.

5.  $(4x - 1)(-3x + 2)$
6.  $(x - 1)(x^2 + x + 1)$
7.  $(x + 1)(x^2 - x + 1)$
8.  $(x - 2)(x + 2)$
9.  $(x - 2)(x - 2)$
10.  $(x^3 + 2x - 1)(x^3 - 5x^2 + 4)$

Find the domain of each of the following functions in 11-15.

11.  $f(x) = \sqrt{1+x}$
12.  $f(x) = \frac{1}{1+x}$
13.  $f(x) = \frac{1}{\sqrt{x}}$
14.  $f(x) = \frac{1}{\sqrt{1+x}}$
15.  $f(x) = \frac{1}{1+x^2}$

16. Given that  $f(x) = x^2 - 3x + 4$ , find and simplify  $f(3)$ ,  $f(a)$ ,  $f(-t)$ , and  $f(x^2 + 1)$ .

Factor the following quadratics

17.  $x^2 - x - 20$
18.  $x^2 - 10x + 21$
19.  $x^2 + 10x + 16$
20.  $x^2 + 8x - 105$
21.  $4x^2 + 11x - 3$
22.  $-2x^2 + 7x + 15$
23.  $x^2 - 2$