

## Unit 1 Algebra Basics Review

**With each polynomial name the type, the degree, how many terms, all coefficients, and all constants.**

1)  $-3x^2 + 5$

Number of terms:

Coefficients:

Constants:

Classify by terms:

Classify by degree:

2)  $x^4 + 6x^3 - 3x + 15$

Number of terms:

Coefficients:

Constants:

Classify by terms:

Classify by degree:

3)  $x^6 - 5x^3 + 1$

Number of terms:

Coefficients:

Constants:

Classify by terms:

Classify by degree:

4)  $7x^3$

Number of terms:

Coefficients:

Constants:

Classify by terms:

Classify by degree:

5) Explain what it means for terms to be "like terms".

**Simplify each expression.**

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

7)  $(-7x^3 - 4x^2) + (x^3 + 6x^2 + 3x^4)$

8)  $(4x^2 + 4x^4) + (5x^2 + 4x - 5x^4)$

9)  $(8n^4 - n^3) - (-3n^3 - n^4 + 8)$

**Find each product.**

10)  $(7n + 2)^2$

11)  $(6x + 6)^2$

12)  $(n + 1)^2$

13)  $(x + 5)(6x + 5)$

14)  $(4x + 2)(6x + 8)$

15)  $(6n + 4)(3n + 2)$

16)  $(2r - 1)(6r^2 + 6r + 3)$

17)  $(8x + 1)(6x^2 + 3x + 7)$

18)  $(2a - 1)(7a^2 + 2a + 3)$

**Evaluate each function.**

19)  $f(x) = x - 2$

a.  $f(-5)$

b.  $f(2x + 1)$

c.  $4f(x)$

20)  $g(x) = 3x^2 + 1$

a.  $g(-3)$

b.  $g(4x)$

c.  $-2g(x)+7$

21)  $h(x) = -5x - 2$

a.  $h(8)$

b.  $h(x - 3)$

c.  $5h(x) - 9$

22)  $k(x) = 3x + 4$

a.  $k(0)$

b.  $k(2x - 9)$

c.  $-2k(x)+12$

**Evaluate each of the following functions:**

23)  $f(x) = x - 2$

$g(x) = 3x^2 + 1$

$h(x) = -5x - 2$

$k(x) = 3x + 4$

24)  $(f + g)(x)$

These are the functions you need to use for the next questions. You do not need to do anything for this problem.

25)  $(k - f)(x)$

26)  $(h + g)(x)$

27)  $(g - h)(x)$

28)  $(h \cdot f)(x)$

29)  $(g \cdot k)(x)$

30)  $(k + g)(4)$

31)  $(h - g)(3)$

32)  $(h + k)(-2)$

33)  $(f \cdot g)(10)$

34)  $(h \cdot f)(-2)$

**Write each expression in exponential form.**

35)  $\sqrt[3]{10n^2}$

36)  $\sqrt{(7p)^3}$

37)  $\sqrt[3]{x}$

38)  $\sqrt[3]{4x^5}$

Write each expression in radical form.

$$39) x^{\frac{8}{5}}$$

$$40) (10x)^{\frac{1}{4}}$$

$$41) 7a^{\frac{5}{3}}$$

$$42) 6x^{\frac{5}{2}}$$

Simplify. Your answer should contain only positive exponents.

$$43) (2n)^{-4} \cdot 2n^{-4}$$

$$44) (2a)^{-4} \cdot a^3$$

$$45) \frac{2x^3 \cdot 2x^{-1}}{4x^{-1}}$$

$$46) \frac{3m^{-3} \cdot 2m^2}{m^{-1}}$$

$$47) \frac{n^4}{(2n^4)^{-4}}$$

$$48) \frac{2m^4}{(m^4)^3}$$

$$49) x^{-2} \cdot 2x^{-\frac{4}{3}} \cdot 3x^3$$

$$50) 4p^{-\frac{3}{2}} \cdot 2p^{\frac{1}{2}}$$

51)  $\left(r^{-\frac{2}{3}}\right)^{-\frac{7}{4}}$

52)  $\left(n^{-\frac{7}{4}}\right)^{-1}$

53)  $\frac{2a^{\frac{2}{3}}}{3a^2}$

54)  $\frac{4x^{\frac{3}{2}}}{2x^{-\frac{1}{4}}}$

55)  $\left(x^{\frac{1}{3}}\right)^{\frac{3}{2}} \cdot \left(x^{\frac{3}{2}}\right)^2$

56)  $x^{\frac{3}{2}} \cdot (x^0)^{-\frac{3}{4}}$

57)  $\frac{2p}{2p^{\frac{1}{2}} \cdot 4p^{-1}}$

58)  $\frac{4p}{2p^{\frac{1}{3}} \cdot 3p^{-1}}$

59)  $\frac{a^{\frac{5}{3}}}{\left(a^{\frac{5}{4}}\right)^2}$

60)  $\frac{n^{\frac{5}{4}}}{\left(n^{-\frac{2}{3}}\right)^{-\frac{7}{4}}}$