Name_____

Section 1-1: Expressions

For #1 - 8, write each as an algebraic expression.

1) a number divided by 2

2) n times 6

3) 11 minus 3

4) 6 squared

5) d more than 3

6) the product of 7 and 10

7) 32 divided by 4

8) 20 decreased by 12

For #9 - 16, write each as a verbal expression.

9) $8 + 10$

10) $\dfrac{14}{2}$

11) $27 - n$

12) $11 - 6$

13) $4n$

14) $2 \cdot 3$

15) $n + 7$

16) $25 - 10$

17) Jonni Deere makes T dollars per hour working at the tractor store and M dollars per hour mowing lawns. If she works for 15 hours at the store and 25 hours mowing, write an expression for how much money she earns.

18) If the width of a rectangle is symbolized as W and the length is symbolized as L, what would an algebraic expression for its perimeter be? What about its area?

19) In football, a touchdown is awarded 6 points and the team can try for another point after the touchdown. Write an expression for a team's score. (Don't forget to define your variables!)

20) The yards of fabric needed to make curtains is three times the length of a window in inches, divided by 36. Write an expression that represents the number of yards needed in terms of the length of the window. (Don't forget to define your variables!)

21) After their terrible accident yesterday, Jack and Jill skipped their water-fetching duties for the day to write an algebraic expression for "Three times the sum of n squared and four." Jack said it was $3n^2 + 4$, and Jill said it was $3(n^2 + 4)$. Is either of them correct? Explain your reasoning.

Algebra I   Name_____

Section 1-2: Substitution

Evaluate each using the values given.

1) qp^2; use $p = -1$, and $q = -5$

2) $-(j - h)$; use $h = 4$, and $j = -5$

3) $k - \dfrac{h}{6}$; use $h = 6$, and $k = 3$

4) $x + y + y$; use $x = 4$, and $y = 1$

5) $x - (y + y)$; use $x = 2$, and $y = -2$

6) $p^2 + q$; use $p = 3$, and $q = -2$

7) $y - (y + x - y)$; use $x = 1$, and $y = 2$

8) $x(z + y + z)$; use $x = 3$, $y = -6$, and $z = -3$

9) $x + \dfrac{x + y}{3}$; use $x = 3$, and $y = -6$

10) $y + z - y - y$; use $y = 3$, and $z = -4$

11) $-4 - (x + y)$; use $x = 5.4$, and $y = -1.2$

12) $p - (p + m)$; use $m = 5.3$, and $p = -2.5$

13) $3^2 - x + y$; use $x = -1.5$, and $y = 3.7$

14) $\dfrac{p}{6 - m} - p$; use $m = 1$, and $p = -0.9$

15) $y + z - z$; use $y = \dfrac{3}{2}$, and $z = -\dfrac{1}{4}$

16) $y - \dfrac{x}{y}$; use $x = \dfrac{11}{6}$, and $y = 1$

17) $-6n - (n - m)$; use $m = 1\dfrac{5}{6}$, and $n = -\dfrac{1}{3}$

18) $\dfrac{xy + x}{y}$; use $x = \dfrac{4}{5}$, and $y = -\dfrac{7}{4}$

Algebra 1   Name_____

Section 7-4 & 7-5: Polynomials

Simplify each expression.

1) $-k + 5k^3 - 5k^3 - k$

2) $6k - 5k^2 - 5k + 5k^2$

3) $9 - 10n^3 - 7 + 7n^3$

4) $10n^2 + 8n + 6n - 8n^2$

5) $\left(4 + 4p^3\right) - \left(1 + 5p^3\right)$

6) $\left(-5x^2 + 1\right) - \left(6 + 2x^2\right)$

7) $\left(7n^2 - 6n\right) + \left(-n + 6n^2\right)$

8) $\left(2n^4 - 8n\right) + \left(5 + n^4\right)$

9) $\left(4x^4 + 2x^2 + 2\right) + \left(-6x^4 - 7 + 3x^2\right)$

10) $\left(2 + 7x^3 + 5x^2\right) + \left(8x^4 - 2x^3 + 7x^2\right)$

11) $\left(2x^2 - 5x^4 + 7\right) - \left(3x^4 - 4 + 7x^2\right)$

12) $\left(-5 + 5x^3 + x^2\right) - \left(2x^3 - 3x^4 - 4x^2\right)$

13) $\left(-7v^4 + 5v + 3 - 5v^2\right) + \left(4 - 3v^4 - 7v^2 + 8v\right) + \left(2v - 6v^2 + 5v^4 - 8\right)$

14) $\left(6p^2 - 3p^3 - 6p^4 + 6\right) + \left(8p^4 + 2p + 3p^3 - p^2\right) - \left(-8 - 6p^4 - 7p - 7p^3\right)$

Algebra 1   Name_____

Section 7-1 & 7-2: Laws of Exponents

Simplify. Your answer should contain only positive exponents.

1) $-4r^2 \cdot 2r^4$

2) $4r \cdot -r^4$

3) $-2y^0 \cdot -2x^4y^3$

4) $3m^4n^3 \cdot m^4n^4$

5) $\left(3n^4\right)^4$

6) $\left(-n^3\right)^4$

7) $\left(-2mn^2\right)^2$

8) $\left(-m\right)^4$

9) $-\dfrac{2n^4}{4n^3}$

10) $\dfrac{2x^3}{x^2}$

11) $\dfrac{yx^4}{3x^2y^0}$

12) $\dfrac{2u^3v^3}{3uv^3}$

13) $2ab^2 \cdot \left(2a^0b^4\right)^4$

14) $\left(vu^4\right)^3 \cdot -2u^4$

15) $\left(\dfrac{2mn^2}{2m^4n^2}\right)^3$

16) $\dfrac{m^4}{\left(-m^2n^0\right)^2}$

17) $-\dfrac{u^2v^2}{2u^3 \cdot 2u^0v^4}$

18) $\dfrac{3x^0y^4}{x^4y^0 \cdot -4y^2}$

19) $\dfrac{yx^4 \cdot y^4 \cdot -xy^4}{\left(-2x^4y^4\right)^4}$

20) $-\dfrac{2xy^0 \cdot -2x^2y^2}{\left(-2y^0\right)^3}$

Algebra 1 Name_____

Section 1-4: Distributive Property

Simplify each expression.

1) $-6(-6b - 3)$

2) $6(-8x + 5)$

3) $9(8x - 10)$

4) $8(3x - 8)$

5) $(-2m - 8) \cdot 2$

6) $(v - 5) \cdot -5$

7) $(3x + 6) \cdot 4$

8) $(8 + 4r) \cdot -1$

9) $-\dfrac{9}{4}\left(m + \dfrac{35}{6}\right)$

10) $-9.7(a - 6.37)$

11) $9 - 4(-10 - 5n)$

12) $-4(7p + 1) + 7$

13) $5 + 10(-10 - 7a)$

14) $9 + 9(6k - 1)$

15) $-4(1 + 4n) + 8(6 - 9n)$

16) $2(1 + 9b) - 9(-2 - 4b)$

17) $8(x + 4) - 4(3x - 8)$

18) $-(7k + 5) + 3(4 + k)$

Algebra 1   Name_____

Section 7-6: Distributive Property

Find each product.

1) $5k(8k - 4)$

2) $2p^3(4p + 4)$

3) $-2v(5v + 7)$

4) $-7k^2(4k - 8)$

5) $-7x(2x + 4)$

6) $-3n^2(7n - 8)$

7) $8a(-7a - 4b)$

8) $-5n(-6m + 3n)$

9) $-7n(2m + n)$

10) $-8x(-4x - 8y)$

11) $2m^2(8m^2 - 2m - 3)$

12) $6p^2(4p^2 + 8p + 7)$

13) $-7k^3(-7k^2 - 8k + 7)$

14) $7k(k^2 - k - 6)$

15) $-3x(5x^2 + 5x - 7)$

16) $-7k(3k^2 - 4k - 8)$

17) $7x^3(-4x^2 - 3xy + 2y^2)$

18) $-4y(-5x^2 - 4xy - 4y^2)$

19) $-8u^4(-2u^2 + 6uv + 5v^2)$

20) $-5u(-6u^2 + 7uv - v^2)$

Algebra 1   Name_____

Section 7-7: Distributive Property

Find each product.

1) $(-5x + 4)(3x + 2)$

2) $(8r - 5)(7r - 1)$

3) $(6n - 5)(-3n - 7)$

4) $(4b + 1)(2b - 6)$

5) $(-6k + 4)(-3k + 5)$

6) $(-6b + 5)(7b - 8)$

7) $(3x - 3y)(-6x - y)$

8) $(-8x - 5y)(-x - 5y)$

9) $(8x - 5y)(-2x + 8y)$

10) $(3x + 5y)(5x - 3y)$

11) $(2m + 8)(5m + 3)$

12) $(7x - 6)(4x - 4)$

13) $(-6m + 1)(m + 2)$

14) $(-3b + 4)(6b - 2)$

15) $(-6v - 3)(-5v^2 + 8v - 4)$

16) $(6x - 4)(2x^2 - x - 4)$

17) $(-6n^2 + 4n - 1)(-7n^2 - n + 4)$

18) $(-8x^2 + 6x - 6)(-8x^2 + 3x - 6)$

Name_____

Section 10-2: Radical Expressions

Simplify.

1) $\sqrt{200x^3}$

2) $\sqrt{112x^4}$

3) $\sqrt{36x^2}$

4) $\sqrt{144p}$

5) $\sqrt{144mn^3}$

6) $\sqrt{175x^4y^4}$

7) $\sqrt{20a^4b^3c^3}$

8) $\sqrt{288mp^4q^3}$

9) $-\sqrt{3} - 2\sqrt{6} - \sqrt{3}$

10) $3\sqrt{2} - \sqrt{3} - 2\sqrt{3}$

11) $\sqrt{10} \cdot \sqrt{5}$

12) $\sqrt{2} \cdot \sqrt{25}$

13) $-5\sqrt{5x^3} \cdot 4\sqrt{8x^3}$

14) $\sqrt{5k^2} \cdot -\sqrt{5k^2}$

15) $\dfrac{3\sqrt{15}}{\sqrt{125}}$

16) $\dfrac{3\sqrt{5}}{\sqrt{2}}$

17) $\dfrac{2}{4 + 4\sqrt{5}}$

18) $\dfrac{3 + 5\sqrt{5}}{\sqrt{5} - 4}$

19) $\dfrac{\sqrt{8n^3}}{2\sqrt{20n^4}}$

20) $\dfrac{\sqrt{15n^4}}{3\sqrt{10n}}$

21) $\dfrac{4\sqrt{4n^3}}{2\sqrt{10n^2}}$

22) $\dfrac{2\sqrt{2x^4}}{\sqrt{5x^4}}$