

## 9<sup>th</sup> Grade Assignments – Week #5

### Individual Work

- Take the below test at some point in the next week. Notes are not permitted.
- See how much you can do with *Exponents & Polynomials* – **Problem Sets #4 and #5**, but save problems #23-32, and #36 from Problem Set #4 for group work (below).

### Group Assignment:

*for Tuesday*

- Work together on *Exponents & Polynomials* – Problem Sets #4, problems #23-32.
- *Puzzle!* Bob has a handful of nickels and dimes worth \$2.45. How many dimes are there if there are 4 more nickels than dimes? (Note: Fairly soon, you will learn how to solve problems like this by using algebra, but for now, it would be best to not use algebra.)

*for Thursday*

- Work together on *Exponents & Polynomials* – Problem Sets #4, problem #36.
- *Puzzle!* A fish bowl contains 200 fish. 99% are goldfish and the rest are guppies. How many goldfish must be removed in order to be left with 98% goldfish?

# Algebra Basics Test

**No calculator for  
the first 5 problems!**  
Simplify. (One point each.)

1)  $(-5)(-2)$

2)  $-5 - 7$

3)  $(15) \div (-3)$

4)  $-3 + 13$

5)  $-7 - -2$

**Calculator is permitted on the rest of  
the test.**

**Solve.** (3 points each.)

6)  $3X - 8 = X + 12$

7)  $10X - 9 = 5X - 17 + X$

8)  $6 - 5(X + 3) = 2X - 3 - X$

**Solve for X in terms of Y.**  
(One point each.)

9)  $Y = 2X + 5$

10)  $3X - 5Y = 12$

**Evaluate** given that

$$a = -\frac{1}{2}, b = 3, c = -5$$

(2 points)

11)  $4c - a^2$

**Simplify.** (1 point each.)

12)  $9x^5 + 2x^5$

13)  $10y^3 + 5y^2$

14)  $(x^2)^4$

15)  $x^3 \cdot x^5$

**Solve.** (3 points each.)

16)  $\frac{1}{5x+2} = \frac{2}{x+1}$

17)  $12 + 3(2X - 4) = 6X$

18)  $\frac{8}{9} = \frac{12}{X}$

19)  $\frac{2}{9}(3X - \frac{1}{2}) = \frac{1}{5}X + \frac{1}{3}$

## Problem Set #4

### Section A

**Simplify.**

- 1)  $6x^3 + 7x^3$
- 2)  $(6x^3)(7x^3)$
- 3)  $(5x^4)(3x^3)$
- 4)  $5x^4 + 3x^3$
- 5)  $3x^3 - 2x^2 + x^3 - 7x^2$
- 6)  $(3x^3)(-2x^2)(x^3)(-7x^2)$
- 7)  $6(5x^2 + 3x - 8)$
- 8)  $6x^3(5x^2 + 3x - 8)$
- 9)  $6x^3(7x^3 + 5x^2 + 3x - 8)$
- 10)  $2x^5(4x^6 - 3x^3 + 7)$
- 11)  $5x^3y^2(3x^2 - 5y^5)$
- 12)  $5x^4y^2 - y^2 + x^4y^2$
- 13)  $(6x^3y^5)(2w^3y^8)$
- 14)  $(5x^4)^2$
- 15)  $(3x^3y^4z^3)^4$
- 16)  $3x^3(2x^4)^2$
- 17)  $3x^2y^3(10x^4y^3)^3$

**Multiply.**

- 18)  $(3x + 2)(4x + 1)$
- 19)  $(4x + 7)(3x + 5)$
- 20)  $(x + 8)(x + 6)$
- 21)  $(5x - 3)(3x - 2)$
- 22)  $(5x + 3)(3x - 2)$
- 23)  $(x + 8)(x - 3)$
- 24)  $(x + 5)(x + 11)$
- 25)  $(x - 5)(x + 11)$
- 26)  $(x + 5)(x - 11)$
- 27)  $(x - 5)(x - 11)$
- 28)  $(4x + 5)^2$

41)  $3\frac{1}{2}x + 4(x + 2\frac{1}{3}) - 3\frac{1}{4} = 5x + 17\frac{1}{2} - 4(5\frac{1}{3}x + 1)$

29) The previous problem is exactly the same as which problem on the previous problem set? (Did you get the same answer?)

30)  $(2x + 3)^2$

31)  $(x + 7)^2$

32)  $(5x - 6)^2$

**Solve.**

33)  $\frac{2}{3}x + 8 = \frac{3}{4}x - 7$

34)  $4 - (x - 1) = -12 - x$

35)  $\frac{5}{2x+1} = \frac{-3}{5-x}$

### Section B

**Estimating Powers of Two**

36) Given that  $2^{10} = 1024$ , we can estimate large powers of two by using  $2^{10} \approx 1000$ . For example,

$$2^{23} = 2^{10} \cdot 2^{10} \cdot 2^3, \approx 1000 \cdot 1000 \cdot 8.$$

Therefore we can say that

$$2^{23} \approx 8,000,000.$$

Approximate each one:

a)  $2^{21}$

b)  $2^{33}$

c)  $2^{52}$

**Solve.**

37)  $8x + 3(-15 + 4x) = 5(x + 2x)$

38)  $7 - 3(x + 1) = 6(8 - x) + 5$

39)  $(x + 3)(x - 1) = (x + 7)(x - 4)$

40)  $\frac{x+1}{x+2} = \frac{x+3}{x+4}$

## Problem Set #5

### Section A

#### Simplify.

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

#### Multiply.

Try doing it in your head!

- 10)  $(4x - 7)(3x - 2)$
- 11)  $(10x + 3)(5x - 4)$
- 12)  $(x + 3)(x + 6)$
- 13)  $(x - 4)(x + 3)$
- 14)  $(x - 5)(x - 8)$
- 15)  $(x + 6)(x + 8)$
- 16)  $(x + 6)(x - 8)$
- 17)  $(x - 6)(x + 8)$
- 18)  $(x - 6)(x - 8)$
- 19)  $(x^3 + 6)(x^3 + 8)$
- 20)  $(x + 6y)(x + 8y)$
- 21)  $(5x - 2y)(x - 3y)$
- 22)  $(x + 6)^2$
- 23)  $(x - 4)^2$
- 24)  $(x - 4y)^2$
- 25)  $(x^5 - 4)^2$

#### Solve.

- 40)  $(2x + 5)(3x - 1) = (6x + 1)(x + 7)$
- 41)  $3 - \frac{1}{4}(\frac{1}{3}x + 18) - 2\frac{1}{4}x = -x + \frac{1}{4}(3x - 4\frac{2}{3}) - \frac{11}{18}$

#### 26) Evaluate.

given  $x = 4$ ;  $y = -3 \dots$

- a)  $x^2 + xy - y + y^2$
- b)  $2(x + y)^x + x(y + 1)^2$

#### Solve.

- 27)  $\frac{5}{x} = \frac{9}{2x}$
- 28)  $\frac{4+x}{3} = 2x - 24$
- 29)  $\frac{5}{x} = \frac{x}{5}$
- 30)  $(x - 3)(x - 2) = (x + 7)(x - 1)$

### Section B

#### 31) Powers of Two.

- a)  $2^{34} \approx \underline{\hspace{1cm}}$     b)  $2^{42} \approx \underline{\hspace{1cm}}$

#### 32) Given $x = \frac{2}{3}$ ; $y = -\frac{1}{2}$

evaluate  $xy^2 - \frac{1}{x} - \frac{x^2}{2y^3}$

#### Simplify.

- 33)  $5n^3x^2(x^3 - 4n^3x^4 + 3n^2x^3)$
- 34)  $k^3m^2p^3 - 6k^3m^2p^3$
- 35)  $(5m^2q^3)(3m^6x^4)(2q^6y)$

#### Multiply.

- 36)  $(5x^3 - 2y^2)(x^3 - 3y^2)$
- 37)  $(4x^5 + 3y^4)^2$
- 38)  $(7x^5y^2 - 10xy^4)^2$
- 39)  $(x + 16)(x - 16)$