

# Algebra 1

## Mid-year Exam Review

Name: \_\_\_\_\_

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1. Perform the operations indicated.

a)  $4\frac{2}{3} - 1\frac{11}{12}$

b)  $\frac{16}{21} \cdot \frac{35}{20} \cdot \frac{3}{4}$

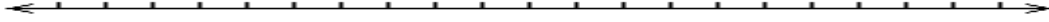
c) Divide:  
 $85.72 \div 1.2$

d) Multiply:  
 $2.8 \times 7.351$

e) Simplify:  
 $\frac{2}{3} \left( \frac{1}{4} - 2\frac{4}{5} \right)$

f) Simplify:  
 $\frac{-9}{5} \cdot \frac{4}{3} - \frac{2}{5} \div \frac{-6}{7}$

2. a)  $a$  is a number which lies between -3 and -4. Plot and label  $a$  on the number line below.



- b) Plot and label  $2a$  on the number line above.  
c) Plot and label  $-a$  on the number line above.  
d) Plot and label  $2-a$  on the number line above.

3. Simplify the following:

a) 
$$\frac{3-2 \cdot (4+1)}{(3-2) \cdot 4+1}$$

b) 
$$18-12 \div (2+4) \cdot 3$$

4. Evaluate when  $x = 4$  and  $y = -3$ .

a) 
$$\frac{|-x+y|}{x-y}$$

b) 
$$\frac{20x}{5x(x-y)}$$

5. Put in order from least to greatest:  $\frac{12}{5}$ ,  $\sqrt{11}$ , 2.42,  $\frac{7}{3}$ ,  $\frac{-74}{31}$

6. Add sets of parentheses to make all of the following equations true.

a.  $3 + 4 \times 6 - 2 = 28$

b.  $5 \times 3 - 6 - 3 = 0$

c.  $5 \times 3 - 6 - 3 = 12$

d.  $45 - 4 \times 5 + 1 = 24$

e.  $45 - 4 \times 5 + 1 = 21$

7. Expand and simplify:

a)  $3(n - 4) + 2(5 - n)$

b)  $6(x - 4) - (6 + x)$

c)  $\frac{-1}{3}(27x - 15)$

d)  $\frac{-2}{5}(25x - 15)$

8. Solve:

a)  $3(n-4) - (5-n) = -2(5-3n)$

b)  $-\frac{2}{3}m + 3 = \frac{1}{2}$

c)  $3x + 5 = \frac{2x + 3}{4}$

d)  $\frac{3}{4}x - \frac{3}{10} = \frac{5}{8}$

9. Evaluate...

a) ...when  $a = \frac{2}{3}$

$$3a^2 - 1$$

b) ...when  $a = -2$

$$\frac{4}{5} - a^2$$

10. Simplify:

a)  $\left(\frac{8}{15}mn^2\right)\left(\frac{-9}{4}m^5\right)$

b)  $5xy \cdot (-3x^3)^2$

c)  $5(3m^2n^3)^2$

d)  $(2r^5)^3$

11. Fill in the blanks.

a)  $\frac{8mn^3}{2m^2n^3} = [\text{_____}]$

b)  $4x^4y = [\text{_____}] \cdot x^3$

c)  $\frac{4p^3z^5}{[\text{_____}]} = 2pz^2$

d)  $\frac{[\text{_____}]}{5x^2y^3} = 3y^2$

12. Multiply out and simplify:

a)  $(5x - 2)^2$

b)  $(y - 3)(y^2 - 3y - 1)$

c)  $(6w + 3)(6w - 3)$

d)  $-2(x + 2)^2$

13. Factor. (Use scratch paper to do trial and error!)

a)  $x^2 + 9x + 20$

b)  $x^2 - 12x + 20$

c)  $y^2 - 8y - 20$

d)  $w^2 - 49$

e)  $2x^2 - 6x - 36$

f)  $-3x^2 + 9x + 12$

g)  $3c^2 + 10c + 8$

g)  $-2d^2 + 50$

14. Solve.

a)  $(3x - 17)(8 - 2x) = 0$

b)  $2x^2 + 3x - 5 = 0$

c)  $(x + 1)(x + 3) = 24$

d)  $y(y - 1) = y(2y - 4)$

e)  $8x^2 + 12x + 4 = 0$

f)  $6x^2 + 15x = 9$

15. Simplify.

a)  $\frac{(x+4)(x-5)}{5(x+3)} \div \frac{(x-5)}{5(x+4)}$

b)  $\frac{3x+9}{x+3} \cdot \frac{2x^2+2x+2}{6x^2+6x+6}$

c)  $\frac{3x+9}{x^2-4} \cdot \frac{x^2+5x+6}{x^2+6x+9}$

d)  $\frac{x^2+2x-8}{x+4} \div (x^2-4)$

16. The sum of a number and four is the same as the product of the number and four. Write and solve an equation to find the number.

17. The sum of three consecutive even numbers is 246.  
Write and solve an equation to find the smallest number.
18. The sum of the squares of two consecutive positive whole numbers is 113.  
Write and solve an equation to find the smaller number. (This one is harder.)
19. If you square a whole number, you get 3136. Use process of elimination to find the number.

20. Find a logical thirtieth term for each sequence.
- a) 6, 9, 12, 15, 18, ...
  - b) 5, 9, 13, 17, 21, ...
  - c) 6, 12, 20, 30, 42, ...
21. There are 12 players on the Bears and 12 players on the Tigers.
- a) If each player on the Bears shakes hands with each player on the Tigers, how many handshakes take place?
  - b) If instead each player on the Bears shakes hands with each other player on the Bears, how many handshakes take place?
22. Write all combinations of nickels, dimes, and quarters that add up to exactly \$0.75 or less.