

Introduction to Algebra  
Practice Test #1

Simplify as much as possible.

1.  $1/4 + 1/8 \div 1/4 - 1/2$

2.  $20 - 5(4 \cdot 2 - 4) + 2^3$

3.  $13 + [9 + (-6)] + (-16)$

4.  $(-7 + 4) + (-3) + (-7 + 8) - (-7)$

5.  $3/4 - (-1/3 - 2/3) + 1/4$

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

7.  $(-7/5)^2$

8.  $\frac{14 - [(6 - 7) - 5]}{-1 - 2 - 1}$

9.  $\frac{2[(5-8)-(2-8)]}{(5-8)+(-1-5)}$

10.  $\frac{17}{42} + \frac{13}{63}$

11.  $-\frac{4}{15} - \frac{7}{18}$

12. Reduce:  $\frac{222}{296}$

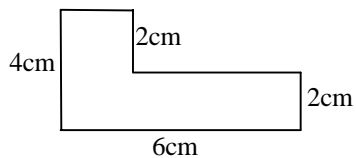
13. Factor to product of primes: 96

Apply the Distributive Property and simplify.

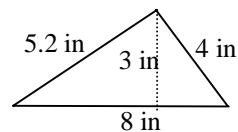
14.  $-7(4x + 5) - 8$

15.  $\frac{2}{3}(3x - 6)$

16. Find the perimeter of the figure.



17. Find the area of the figure.



Introduction to Algebra  
Practice Test #1  
Solutions

Simplify as much as possible.

1.  $\frac{1}{4} + \frac{1}{8} \div \frac{1}{4} - \frac{1}{2}$

$$\frac{1}{4} + (\frac{1}{8} \div \frac{1}{4}) - \frac{1}{2}$$

$$\frac{1}{4} + (\frac{1}{8} \cdot \frac{4}{1}) - \frac{1}{2}$$

$$\frac{1}{4} + \frac{1}{2} - \frac{1}{2}$$

$$\frac{1}{4}$$

Order of operations states to do division before adding and subtracting.

2.  $20 - 5(4 \cdot 2 - 4) + 2^3$

$$20 - 5(8 - 4) + 8$$

$$20 - 5(4) + 8$$

$$20 - 20 + 8$$

$$8$$

3.  $13 + [9 + (-6)] + (-16)$

$$13 + 3 + (-16)$$

$$16 + (-16)$$

$$16 - 16$$

$$0$$

$16 + (-16)$  is the same as  $16 - 16$  because the plus sign (positive) and the negative sign come together to make a minus sign. Think of the signs being multiplied:  $(+)(-) = -$

4.  $(-7 + 4) + (-3) + (-7 + 8) - (-7)$

$$-3 - 3 + 1 + 7$$

$$-6 + 1 + 7$$

$$-5 + 7$$

$$2$$

$+(-3)$  is the same as  $-3$   
 $-(-7)$  is the same as  $+7$

5.  $\frac{3}{4} - (-\frac{1}{3} - \frac{2}{3}) + \frac{1}{4}$

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

$$\frac{3}{4} + 1 + \frac{1}{4}$$

$$1 \frac{3}{4} + \frac{1}{4}$$

$$1 \frac{4}{4} = 1 + 1 = 2$$

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

$$7(16) + 4(-8)$$

$$112 - 32$$

$$80$$

$$7. \frac{(-7/5)^2}{(-7)^2} = \frac{49}{25}$$

$$8. \frac{14 - [(6 - 7) - 5]}{-1 - 2 - 1} = \frac{14 - [-1 - 5]}{-3 - 1} = \frac{14 - (-6)}{-4} = \frac{14 + 6}{-4} = \frac{20}{-4} = -5$$

$$9. \frac{2[(5 - 8) - (2 - 8)]}{(5 - 8) + (-1 - 5)} = \frac{2[-3 - (-6)]}{-3 + (-6)} = \frac{2[-3 + 6]}{-3 - 6} = \frac{2(3)}{-9} = \frac{6}{-9} = -2/3$$

$$10. \frac{17}{42} + \frac{13}{63} = \frac{17 * 3}{42 * 3} + \frac{13 * 2}{63 * 2} = \frac{51}{126} + \frac{26}{126} = \frac{77}{126} = \frac{\cancel{7} * 11}{\cancel{7} * 18} = \frac{11}{18}$$

To find LCD:

$$42 = 2 * 21 = 2 * 3 * 7$$

$$63 = 3 * 21 = 3 * 3 * 7$$

LCD equals the like factors times the unlike factors.

$$\text{LCD of } 42 \text{ \& } 63 = (3 * 7)(2 * 3) = 21 * 6 = 126$$

$$11. -\frac{4}{15} - \frac{7}{18} = \frac{-4 * 6}{15 * 6} - \frac{7 * 5}{18 * 5} = \frac{-24}{90} - \frac{35}{90} = \frac{-59}{90}$$

$$15 = 3 * 5$$

$$18 = 2 * 9 = 2 * 3 * 3$$

$$\text{LCD of } 15 \text{ \& } 18 = (3)(5 * 2 * 3) = 3 * 30 = 90$$

12. Reduce:  $\frac{222}{296}$

$$\frac{\cancel{2} \cdot \cancel{3} \cdot \cancel{37}}{\cancel{2} \cdot \cancel{2} \cdot \cancel{2} \cdot \cancel{37}} = \frac{3}{2 \cdot 2} = \frac{3}{4}$$

To reduce fractions, break each number to its prime factors.

$$222 = 2 \cdot 111 = 2 \cdot 3 \cdot 37$$

$$296 = 2 \cdot 148 = 2 \cdot 2 \cdot 74 = 2 \cdot 2 \cdot 2 \cdot 37$$

The greatest common factor (GCF) is the product of the common factors.

$$\text{GCF of } 222 \text{ \& } 296 = 2 \cdot 37 = 74$$

13. Factor to product of primes: 96

$$96 = 2 \cdot 48 = 2 \cdot 2 \cdot 24 = 2 \cdot 2 \cdot 2 \cdot 12 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 6 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 = 2^5 \cdot 3$$

Apply the Distributive Property and simplify.

14.  $-7(4x + 5) - 8$

$$-7(4x) - 7(5) - 8$$

$$-28x - 35 - 8$$

$$-28x - 43$$

15.  $\frac{2}{3}(3x - 6)$

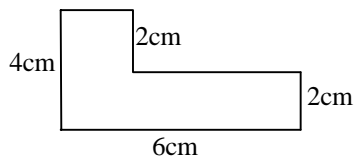
$$\frac{2}{3}(3x) + \frac{2}{3}(-6)$$

$$2x - 4$$

$$\left(\frac{2}{3}\right)(3x/1) = 6x/3 = 2x$$

$$\left(\frac{2}{3}\right)(-6/1) = (-12/3) = -4$$

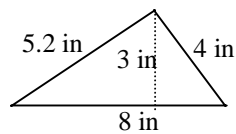
16. Find the perimeter of the figure.



Notice the total vertical length is 4 on each side. Therefore the total horizontal length is 6 on each side.

$$P = 4 + 6 + 2 + 2 + 6 = 20 \text{ cm}$$

17. Find the area of the figure.



Area of a triangle =  $\frac{1}{2} \cdot \text{base} \cdot \text{height}$

base = 8, height = 3

$$A = \frac{1}{2} \cdot 8 \cdot 3$$

$$A = \frac{1}{2} \cdot 24 = 12 \text{ sq. in.}$$