Math351
Practice Exam #01

1. Simplify the expressions.

   a) $14 - 6$ b) $-12 - 3$ c) $-45 + 6$

2. Use the rule for the order of operations to simplify the expressions.
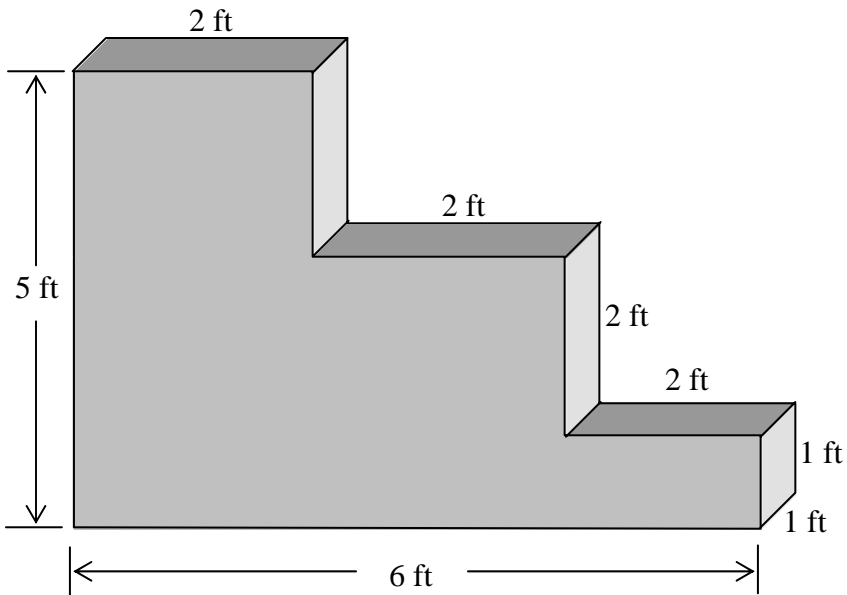
   a) $6 + 12 \div 2 \cdot 2$ b) $3 \cdot 3^2 + 8 \div 4 - 2^2$
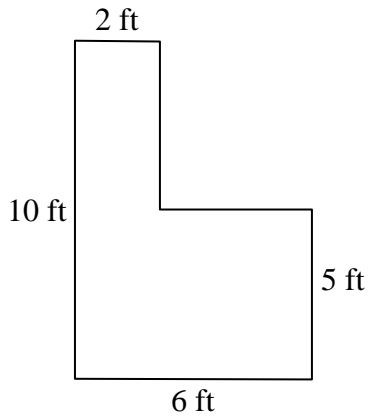
3. Simplify the expressions.

a) $\dfrac{-4^2 - 2^2}{-1 - 1}$

b) $\dfrac{(-2)^2 - 3^2}{2 - 3}$

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4. Find the volume of the box below.

5. Find the following:

a) Find the **<u>Perimeter</u>** for the shape below.

2 ft

10 ft

5 ft

6 ft

b) Find the **<u>Area</u>** for the shape below.

6 ft

5 ft

3 ft

2 ft

10 ft

2 ft
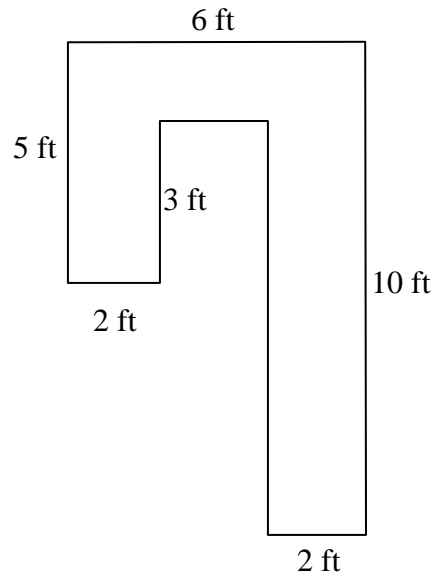
6. Simplify as much as possible.

a) $-2^2 - \left| -2 - 1 \right| + 2$

b) $5 + \left(-\left| -2 \right| + 3 \right)$

7. First, write out the mathematical expression. Then simplify the expression.

   a) The difference between -5 and -4.   b) Subtract -3 from the quotient of -6 and 3.

   _____   _____

   _____   _____

   _____   _____

   _____   _____

8. Simplify the expressions.

   a) $-3\left[(-2)^2 - 1\right]$ b) $-2\left[(4+3)^2 - 39\right]^2$

   _____   _____

   _____   _____

   _____   _____

   _____   _____

   _____   _____

9. How many **4-ounce** glasses can you fill using five **12-ounce** bottles of soda?

10. By inspection, find a solution to each equation.

a) $-3 + x = 4$ b) $-3 \cdot x = -27$ c) $2 - x = 6$

11. Answer true or false.

a) The opposite of -3 is greater than $|4|$.   b) $-|-1| > |-2|$ c) $-75 < -76$

12. Simplify the expressions below.

a) $\dfrac{3}{2} - \dfrac{1}{6}$

b) $\dfrac{2}{3} - \dfrac{9}{6}$

c) $\dfrac{1}{3} + \dfrac{3}{4} - \dfrac{5}{6}$

13. Simplify the expressions below as much as possible.

a) $\dfrac{5}{2} \cdot \dfrac{3}{4} + \dfrac{1}{4}$
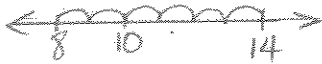
b) $\dfrac{2}{5} - \left| -\dfrac{4}{3} \right| - 2$

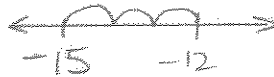# Math351
Practice Exam #01
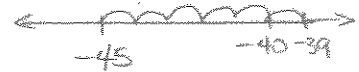
1. Simplify the expressions.

   a) $14 - 6$ b) $-12 - 3$ c) $-45 + 6$

        $\boxed{8}$ $\boxed{-15}$ $\boxed{-39}$

        8   10   14   -15   -12   -45   -40 -39

2. Use the rule for the order of operations to simplify the expressions.

   a) $6 + 12 \div 2 \cdot 2$ b) $3 \cdot 3^2 + 8 \div 4 - 2^2$

      $6 + 6 \cdot 2$ $3 \cdot 9 + 8 \div 4 - 4$

      $6 + 12$ $27 + 8 \div 4 - 4$

      $\boxed{18}$ $27 + 2 - 4$

                                $29 - 4$

                                 $\boxed{25}$

3. Simplify the expressions.

a) $\dfrac{-4^2 - 2^2}{-1-1}$

$\dfrac{-16-4}{-2}$

$\dfrac{-20}{-2}$

$\boxed{10}$

b) $\dfrac{(-2)^2 - 3^2}{2-3}$

$\dfrac{4-9}{-1}$

$\dfrac{-5}{-1}$

$\boxed{5}$

4. Find the volume of the box below.

$V_I = (2ft)(1ft)(2ft)$
$= 4ft^3$

I

2ft
2ft
1ft

2 ft

2ft

5 ft

2 ft

2 ft

2 ft

1 ft

1 ft

6 ft

II

2ft

1ft

4ft

$V_{II} = (4ft)(1ft)(2ft)$
$V_{II} = 8ft^3$

III

1ft
1ft

6ft

$V_{III} = (6ft)(1ft)(1ft)$
$V_{III} = 6ft^3$

$\boxed{V_{Total} = 4+8+6 \, ft^3 = 18ft^3}$

5. Find the following:

a) Find the **Perimeter** for the shape below.

2 ft

5 ft

4 ft

10 ft

5 ft

6 ft
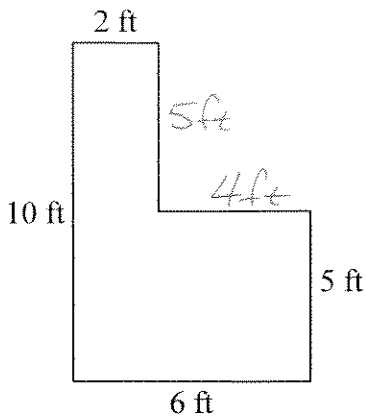
$P = 10 + 6 + 5 + 4 + 5 + 2$ ft

$P = 10 + 10 + 10 + 2$ ft

$P = 30 + 2$ ft

$P = 32$ ft

b) Find the **Area** for the shape below.

6 ft

2 ft II

2 ft

5 ft I

3 ft

III 10 ft

2 ft

2 ft

II 2 ft

2 ft
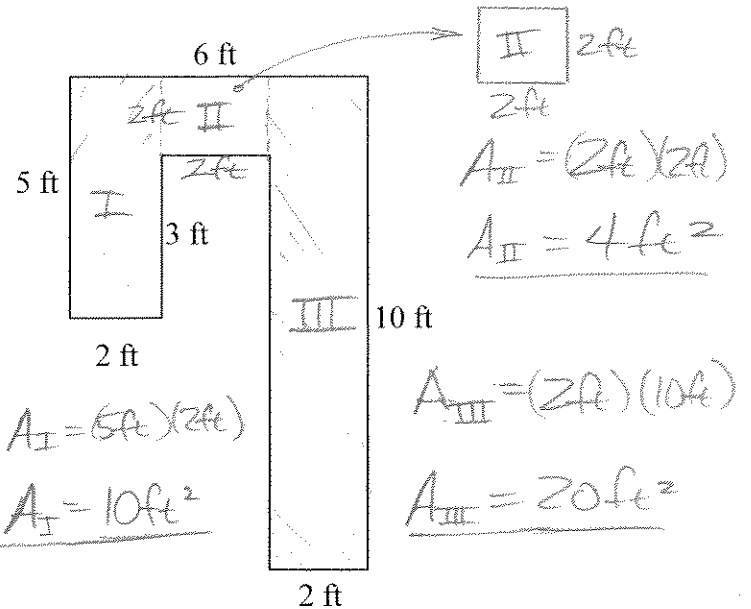
$A_{II} = (2ft)(2ft)$

$A_{II} = 4 ft^2$

$A_{III} = (2ft)(10ft)$

$A_{III} = 20 ft^2$

$A_I = (5ft)(2ft)$

$A_I = 10 ft^2$

$A_{Total} = A_I + A_{II} + A_{III}$

$= 10 ft^2 + 4 ft^2 + 20 ft^2$

$= 34 ft^2$

6. Simplify as much as possible.

a) $-2^2 - |-2 - 1| + 2$

$-4 - |-2 - 1| + 2$

$-4 - |-3| + 2$

$-4 - 3 + 2$

$-7 + 2$

-5

b) $5 + \left(-|-2| + 3 \right)$

$5 + (-2 + 3)$

$5 + (1)$

$5 + 1$

6

7. First, write out the mathematical expression. Then simplify the expression.

a) The difference between -5 and -4.

$$-5 - (-4)$$

$$-5 + 4$$

$$\boxed{-1}$$

b) Subtract -3 from the quotient of -6 and 3.

$$(-6 \div 3) - (-3)$$

$$(-6 \div 3) - (-3)$$

$$-2 - (-3)$$

$$-2 + 3$$

$$\boxed{1}$$

8. Simplify the expressions.   Note: Use the rule for order of operations!

a) $-3\left[(-2)^2 - 1\right]$

$$-3\left[(-2)^2 - 1\right]$$

$$-3\left[4 - 1\right]$$

$$-3\left[3\right]$$

$$\boxed{-9}$$

b) $-2\left[(4+3)^2 - 39\right]^2$

$$-2\left[(4+3)^2 - 39\right]^2$$

$$-2\left[7^2 - 39\right]^2$$

$$-2\left[49 - 39\right]^2$$

$$-2\left[10\right]^2$$

$$-2 \cdot 100$$

$$\boxed{-200}$$

9. How many **4-ounce** glasses can you fill using five **12-ounce** bottles of soda?

5×12 ounces $= 60$ ounces total

$$\frac{60}{4} = \boxed{15 \text{ glasses}}$$

10. By inspection, find a solution to each equation.

a) $-3 + x = 4$

$$\boxed{x = 7}$$

b) $-3 \cdot x = -27$

$$\boxed{x = 9}$$

$-3 \cdot 9 = 27$
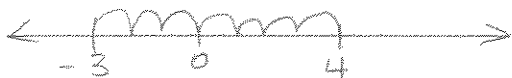
c) $2 - x = 6$

$$\boxed{x = -4}$$

$2 - (-4)$

$2 + 4$

6

11. Answer true or false.

a) The opposite of -3 is greater than $|4|$.

$-(-3)$

3

$|4| = 4$

$3 > 4$

$\boxed{\text{False}}$

b) $-|-1| > |-2|$

$-1 > 2$

$\boxed{\text{False}}$

c) $-75 < -76$

$\boxed{\text{False}}$

12. Simplify the expressions below.

a) $\dfrac{3}{2} - \dfrac{1}{6}$ LCD=6

$\dfrac{3}{2}\left(\dfrac{3}{3}\right) - \dfrac{1}{6}$

$\dfrac{9}{6} - \dfrac{1}{6}$

$\dfrac{9-1}{6}$

$\dfrac{8}{6}$

$\boxed{\dfrac{4}{3}}$

b) $\dfrac{2}{3} - \dfrac{9}{6}$ LCD=6

$\dfrac{2}{3}\left(\dfrac{2}{2}\right) - \dfrac{9}{6}$

$\dfrac{4}{6} - \dfrac{9}{6}$

$\dfrac{4-9}{6}$

$\boxed{\dfrac{-5}{6}}$

– OR –

$\boxed{-\dfrac{5}{6}}$

c) $\dfrac{1}{3} + \dfrac{3}{4} - \dfrac{5}{6}$ LCD=12

$\dfrac{1}{3}\left(\dfrac{4}{4}\right) + \dfrac{3}{4}\left(\dfrac{3}{3}\right) - \dfrac{5}{6}\left(\dfrac{2}{2}\right)$

$\dfrac{4}{12} + \dfrac{9}{12} - \dfrac{10}{12}$

$\dfrac{4+9-10}{12}$

$\dfrac{3}{12}$

$\boxed{\dfrac{1}{4}}$

13. Simplify the expressions below as much as possible.

a) $\dfrac{5}{2} \cdot \dfrac{3}{4} + \dfrac{1}{4}$

$\dfrac{15}{8} + \dfrac{1}{4}$ LCD=8

$\dfrac{15}{8} + \dfrac{1}{4}\left(\dfrac{2}{2}\right)$

$\dfrac{15}{8} + \dfrac{2}{8}$

$\dfrac{15+2}{8}$

$\boxed{\dfrac{17}{8}}$

b) $\dfrac{2}{5} - \left|-\dfrac{4}{3}\right| - 2$

$\dfrac{2}{5} - \dfrac{4}{3} - \dfrac{2}{1}$ LCD=15

$\dfrac{2}{5}\left(\dfrac{3}{3}\right) - \dfrac{4}{3}\left(\dfrac{5}{5}\right) - \dfrac{2}{1}\left(\dfrac{15}{15}\right)$

$\dfrac{6}{15} - \dfrac{20}{15} - \dfrac{30}{15}$

$\dfrac{6-20-30}{15}$

$\dfrac{-14-30}{15}$

$\boxed{\dfrac{-44}{15}}$

– OR –

$\boxed{-\dfrac{44}{15}}$