Math351
Practice Exam #01

1. Identify the place value of the digit 4 in each whole number.
   a) 1,543,978  
   b) 401,579,020  
   c) 3,004,000

2. Round each number to the indicated place value.
   a) 153 to the nearest ten
      b) 2,599,587 to the nearest hundred-thousand
      c) 67,590 to the nearest one-thousand
      d) 45,873 to the nearest hundred

3. Find the value of each expression.
   a) $-4 + 9$  
   b) $-7 + 13$  
   c) $-8 + 5$
   
   c) $-2 + (-7)$  
   e) $-7 - (-10)$  
   f) $-3 - 3$
4. Evaluate the expression without a calculator.
   a) \(-|7| + (-6)\)  
   b) \(|6 - 12|\)  
   c) \((-14) + |21|\)

5. Fill in the blank with < or > to make the statement true.
   a) \(-15____-16\)  
   b) \(58____59\)  
   c) \(-51____-50\)

6. Use the rule for the order of operations to simplify the expressions.
   a) \(-3^2 - |4 - 6|\)  
   b) \((-6)^2 + \left(-|2| + 4\right)\)
   c) \(3\sqrt{64} \div 2\sqrt{9}\)  
   d) \(6|9 - 5| - 8\)
7. Write each statement as an equation and find the unknown number. Use \( x \) to represent the unknown number.

a) Eleven more than twice a number is 5.

\( 2x + 11 = 5 \)

b) Ten subtracted from three times a number is -4.

\( 3x - 10 = -4 \)

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

a) \( -7 \left[ (-3)^2 + 1 \right] - (-2)^4 \)

\( = -7 \left[ 9 + 1 \right] - 16 \)
\( = -7 \cdot 10 - 16 \)
\( = -70 - 16 \)
\( = -86 \)

b) \( -3 - \left[ (3 + 2)^2 - 23 \right]^2 \)

\( = -3 - \left[ 5^2 - 23 \right]^2 \)
\( = -3 - \left[ 25 - 23 \right]^2 \)
\( = -3 - (2)^2 \)
\( = -3 - 4 \)
\( = -7 \)
9. The number of minutes it took Lisa to do her homework was 10 minutes less than twice the amount it took Adolfo. If Lisa spent 40 minutes doing her homework, how long did it take Adolfo to do his homework?

10. Simplify each expression by combining like terms.
   a) \(-8x - 5y + 3x - y + 6\)
   b) \(-5(-2r - 3q) - (-q - r)\)

11. Solve each equation.
   a) \(2x - 16 = 18\)
   b) \(7 - 7x = -28\)
   c) \(10c - 9 = 8c + 5\)
12. Solve each equation.

a) \[ 11 + 3p - 5 = 8p + 6 - p \]

b) \[ 6(2t - 1) + 15 = 4t + 3(t + 3) \]

13. On the highway, the gas mileage for David’s motorcycle is 30 more than twice that of his work truck. If his motorcycle gets 56 mpg on the highway, what is the gas mileage of David’s work truck on the highway?
14. Determine whether each equation represents an example of the commutative, associative, or distributive property.
   a) \[ 3 + (2 + x) = (3 + 2) + x \]
   b) \[ x(3 + 2) = 3x + 2x \]
   c) \[ (t + 1) + 4 = (1 + t) + 4 \]
   d) \[ 8(5 \cdot 4) = 8(4 \cdot 5) \]
   e) \[ x + 2 = 2 + x \]
   f) \[ (12 \cdot 6) \cdot 7 = 12(6 \cdot 7) \]

15. Professor Perez’s 10:30 A.M. class has 12 more students than his 8 A.M. class. All together the classes contain 62 students. How many students are in each class?
1. Identify the place value of the digit 4 in each whole number.
   a) 1,543,978
   b) 401,579,020
   c) 3,004,000
   ↑
   Ten-thousands  Hundred Million  One-thousand

2. Round each number to the indicated place value.
   a) 153 to the nearest ten
      \[\overline{150}\]
   b) 2,599,587 to the nearest hundred-thousand
      \[\overline{2,600,000}\]
   c) 67,590 to the nearest one-thousand
      \[\overline{68,000}\]
   d) 45,873 to the nearest hundred
      \[\overline{45,900}\]

3. Find the value of each expression.
   a) \(-4 + 9\)
      \[5\]
   b) \(-7 + 13\)
      \[6\]
   c) \(-8 + 5\)
      \[-3\]
   d) \(-2 + (-7)\)
      \[-9\]
   e) \(-7 - (-10)\)
      \[3\]
   f) \(-3 - 3\)
      \[-6\]
4. Evaluate the expression without a calculator.
   a) \(-7 + (-6)\)
   \[-7 + (-6)\]
   \[-13\]
   b) \(|6 - 12|\)
   \(|-6|\)
   \[6\]
   c) \(-(-14) + |21|\)
   \[-14| + 21\]
   \[35\]

5. Fill in the blank with < or > to make the statement true.
   a) \(-15 \underline{\_} -16\)
   \[\underline{<}\]
   \[-17 -16 -15\]
   b) \(58 < 59\)
   \[58 < 59\]
   c) \(-51 \underline{\_} -50\)
   \[\underline{<}\]
   \[-52 -51 -50\]

6. Use the rule for the order of operations to simplify the expressions.
   a) \(-3^2 - |-4 - 6|\)
   \[-3^2 - (-10)\]
   \[-9 - 10\]
   \[-19\]
   b) \((-6)^2 + (-|2| + 4)\)
   \[(-6)^2 + (-2 + 4)\]
   \[36 + 2\]
   \[38\]
   c) \(3 \sqrt{64} \div 2 \sqrt{9}\)
   \[3 \cdot 8 \div 2 \cdot 3\]
   \[12 \cdot 3\]
   \[36\]
   d) \(6 \mid 9 - 5 \mid -8\)
   \[6 \mid 4 \mid -8\]
   \[24 - 8\]
   \[16\]
7. Write each statement as an equation and find the unknown number. Use \( x \) to represent the unknown number.

a) Eleven more than twice a number is 5.

\[
2x + 11 = 5
\]

\[
\frac{2x + 11}{2} = \frac{5}{2}
\]

\[
x = \boxed{-3}
\]

b) Ten subtracted from three times a number is -4.

\[
3x - 10 = -4
\]

\[
\frac{3x - 10}{3} = \frac{-4}{3}
\]

\[
x = \boxed{2}
\]

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

a) \(-7 \left[ (-3)^2 + 1 \right] - (-2)^4 \)

\[
-7 \left[ 9 + 1 \right] - 16
\]

\[
-7 \left[ 10 \right] - 16
\]

\[
-7 \cdot 10 - 16
\]

\[
-70 - 16
\]

\[
\boxed{-86}
\]

b) \(-3 - \left[ (3+2)^2 - 23 \right]^2 \)

\[
-3 - \left[ 5^2 - 23 \right]^2
\]

\[
-3 - \left[ 25 - 23 \right]^2
\]

\[
-3 - 2^2
\]

\[
-3 - 4
\]

\[
\boxed{-7}
\]
9. The number of minutes it took Lisa to do her homework was 10 minutes less than twice the amount it took Adolfo. If Lisa spent 40 minutes doing her homework, how long did it take Adolfo to do his homework?

Let $x = \text{Adolfo's time to complete his homework} $

Since Lisa's time is 10 minutes less than twice Adolfo's, we get: $2x - 10$ for Lisa's time. Finally, since Lisa took 40 minutes to do her homework, we get:

$2x - 10 = 40$

$\frac{2x}{2} = \frac{50}{2}$

$x = 25$ minutes

10. Simplify each expression by combining like terms.

a) $-8x - 5y + 3x - y + 6$

$-5x - 6y + 6$

b) $-5(-2y - 3q) - (-q - r)$

$10r + 15q + q + r$

$11r + 16q$

11. Solve each equation.

a) $2x - 16 = 18$

$\frac{2x}{2} = \frac{34}{2}$

$x = 17$

b) $7 - 7x = -28$

$\frac{-7x}{-7} = \frac{-35}{-7}$

$x = 5$

c) $10c - 9 = 8c + 5$

$\frac{2c}{2} = \frac{14}{2}$

$c = 7$
12. Solve each equation.

a) \(11 + 3p - 5 = 8p + 6 - p\)

\[
\begin{align*}
6 + 3p &= 7p + 6 \\
-3p &= 4p \\
6 &= 4p \\
\frac{6}{4} &= p \\
1p &= 0
\end{align*}
\]

b) \(6(2t - 1) + 15 = 4t + 3(t + 3)\)

\[
\begin{align*}
12t - 6 + 15 &= 4t + 3t + 9 \\
12t + 9 &= 7t + 9 \\
-7t &= -7t \\
5t + 9 &= 9 \\
-9 &= -9 \\
\frac{5t}{5} &= \frac{0}{5} \\
t &= 0
\end{align*}
\]

13. On the highway, the gas mileage for David’s motorcycle is 30 more than twice that of his work truck. If his motorcycle gets 56 mpg on the highway, what is the gas mileage of David’s work truck on the highway?

Let \(x\) = Truck mpg

David’s motorcycle mpg is \(2x + 30\)

Since the motorcycle gets 56 mpg, we get the equation \(2x + 30 = 56\)

\[
\begin{align*}
2x + 30 &= 56 \\
-30 &= -30 \\
2x &= 26 \\
\frac{2x}{2} &= \frac{26}{2} \\
x &= 13 \text{ mpg}
\end{align*}
\]
14. Determine whether each equation represents an example of the commutative, associative, or distributive property.

a) \( 3 + (2 + x) = (3 + 2) + x \)  \textbf{Associative}  

b) \( x(3 + 2) = 3x + 2x \)  \textbf{Distributive}  

c) \( (t + 1) + 4 = (1 + t) + 4 \)  \textbf{Commutative}  

d) \( 8(5.4) = 8(4.5) \)  \textbf{Commutative}  

e) \( x + 2 = 2 + x \)  \textbf{Commutative}  

f) \( (12 \cdot 6) \cdot 7 = 12(6 \cdot 7) \)  \textbf{Associative}  

15. Professor Perez's 10:30 A.M. class has 12 more students than his 8 A.M. class. All together the classes contain 62 students. How many students are in each class?

Let \( x \) = the number of students in the 8 A.M. class.

Since the 10:30 A.M. class has 12 more students, the expression \( x + 12 \) represents the number of students in the 10:30 A.M. class.

The number of students in both classes must sum to 62, so we get the equation \( x + x + 12 = 62 \).

\[
\begin{align*}
x + x + 12 &= 62 \\
x + x &= 62 - 12 \\
x + x &= 50 \\
2x &= 50 \\
x &= \frac{50}{2}
\end{align*}
\]

There are 25 students in the 8 A.M. class and 37 students in the 10:30 A.M. class.