8.1 Substituting Values into Algebraic Expressions

Example 1: Calculate $3m + 6$ if you are given that $m = 2$

Answer: You have to “substitute” or “replace” the variable “m” with given value for “m”, which in this case is 2.

\[
\begin{align*}
3m + 6 & = 3(2) + 6 \\
& = 6 + 6 \\
& = 12
\end{align*}
\]

NOTE: You must follow BEDMAS when calculating the value:

Example 2: Calculate $3x + 8$ if you are given $x = -2$

Answer: $3x + 8$ if $x = -2$

\[
\begin{align*}
3x + 8 & = 3(-2) + 8 \\
& = -6 + 8 \\
& = 2
\end{align*}
\]

Now try a few of these on your own. Remember to follow your order of operations. (BEDMAS)

Calculate the following:

<table>
<thead>
<tr>
<th>a) $12 - 2p$ when $p = 2$</th>
<th>b) $9 + 2r - 6$ when $r = 4$</th>
<th>c) $\frac{a + 6b}{2}$ when $a = 2, b = 3$</th>
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HOMEWORK: Substitution into Algebraic Expressions Worksheet
Substitution into Algebraic Expressions Worksheet

Directions: Please answer the following in your binders/ scribblers. Do not do the work on the sheet there is not enough room.

1. If $a = 2$, $b = 5$, and $c = 7$, evaluate the following by substituting these values into the following:

   a) $3b$  
   b) $6a$  
   c) $2c$  
   d) $4b$  
   e) $3c$

   f) $2b + 3$  
   g) $3a + 1$  
   h) $2c - 3$  
   i) $5a + 7$  
   j) $9b$

   k) $a + b$  
   l) $a + c$  
   m) $c - b$  
   n) $a + b + c$  
   o) $-a$

   p) $3a + 2b$  
   q) $5c + 2a$  
   r) $3b + 2c$  
   s) $9a - 2b$  
   t) $-3c$

2. If $a = 3$, $b = 4$, and $c = 10$, evaluate the following by substituting these values into the following:

   a) $3b$  
   b) $6a$  
   c) $2c$  
   d) $4b$  
   e) $3c$

   f) $2b + 3$  
   g) $3a + 1$  
   h) $2c - 3$  
   i) $5a + 7$  
   j) $9b$

   k) $a + b$  
   l) $a + c$  
   m) $c - b$  
   n) $a + b + c$  
   o) $-a$

   p) $3a + 2b$  
   q) $5c + 2a$  
   r) $3b + 2c$  
   s) $9a - 2b$  
   t) $-3c$

3. If $a = 0$, $b = 20$, and $j = 0$, evaluate the following by substituting these values into the following:

   a) $3b$  
   b) $6a$  
   c) $2c$  
   d) $4b$  
   e) $3c$

   f) $2b + 3$  
   g) $3a + 1$  
   h) $2c - 3$  
   i) $5a + 7$  
   j) $9b$

   k) $a + b$  
   l) $a + c$  
   m) $c - b$  
   n) $a + b + c$  
   o) $-a$

   p) $3a + 2b$  
   q) $5c + 2a$  
   r) $3b + 2c$  
   s) $9a - 2b$  
   t) $-3c$

4. If $x = 3$, $y = 2$ and $z = 5$, try to complete the following algebraic expressions: HINT: substitute the variables (letters) for the ??? marks.

   a) $? + ? = 7$  
   b) $? + ? = 5$  
   c) $? - ? = 2$  
   d) $2? + 3? = 16$

5. A builder rents a digger. He pays a fixed charge of $30 plus $10 per hour to rent the digger. Work out how much he pays to rent the digger for:

   a) 1 hour  
   b) 3 hours  
   c) 4 hours  
   d) 10 hours  
   e) $n$ hours

HINT: for part e) can you write an algebraic expression.