

1. Perform the divisions. Show both the quotient and the remainder. For example,

$$19 \div 7 = 2 \text{ R } 5.$$

(a)  $38 \div 8 =$

(b)  $75 \div 11 =$

2. Simplify each of the following expressions by applying the order of operations agreement. Show all steps. Perform only one operation in each step.

(a)  $2 \cdot 5^2 - (6 \cdot 5 - 3^2) \div 3 =$

(b)  $20 - 7 - 1 =$

(c)  $10^2 - 7^2 =$

(d)  $(10 - 7)^2 =$

(e)  $2^3 - 2(11 - 3^2)^2 =$

(f)  $\frac{5^2 - 3^2}{2^2} =$

(g)  $\frac{(5 - 3)^2}{2^2} =$

(h)  $120 \div 6 \cdot 2 =$

(i)  $\left( \left( (7 - 4)^2 - 5 \right)^2 - 6 \right)^2 - 7 =$

(j)  $\frac{22 - 3^2 + 2(20 - 3^2 - 5)}{3^2 - 2^2} =$

(k)  $\frac{2^4 - 6 \div 2 \cdot 3}{5^2 - 100 \div 4} =$

(l)  $2^6 - 2(3^2 + 2^3) + 3(2(15 - 2^3) - 2^2) =$

(m)  $4(3(2(2^2 - 1) + 1) - 1) + 5 =$

3. Insert parentheses into the next line to make the statement true.

$$2 + 3 \cdot 4 - 1 + 3^2 = 100$$

4. Let  $a = 4$ ,  $b = 3$ , and  $c = 1$ . Evaluate each of the following expressions.

(a)  $a + 2b - 3c =$

(b)  $\frac{2a - b}{a - (b + 1)} =$

(c)  $a^2 - 2c^2 =$

(d)  $2ab^2 =$

(e)  $(a - 1)^b =$

5. Let  $x = 5$  and  $y = 3$ .

(a) Evaluate  $(x + y)^2 =$

(b) Evaluate  $x^2 + y^2 =$

(c) Based on the previous two problems, determine if the following statement is true or false.

If  $x$  and  $y$  are any numbers, then  $(x + y)^2 = x^2 + y^2$

(d) Consider the picture shown below. Can you explain how it relates to the previous problem?

(e) Consider the picture shown below. Based on the picture below, find the correct formula for  $(x + y)^2$ ?

