

1. Perform the divisions. Show both the quotient and the remainder. For example,  $19 \div 7 = 2 \text{ R } 5$ , (since  $19 = 7 \cdot 2 + 5$ ).

a)  $38 \div 8$                       b)  $75 \div 11$

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

a)  $7 \cdot 3^2 - (3 + 2 \cdot 5 - 1) \div 2$

i)  $\sqrt{169 - 144}$

b)  $15 - 7 + 3$

j)  $\sqrt{169} - \sqrt{144}$

c)  $120 \div 6 \cdot 2$

k)  $2^3 - 2(11 - 3^2)^2$

d)  $8^2 - 3^2$

l)  $\left( \left( (8 - 5)^2 - 7 \right)^2 - 2 \right)^2 - 1$

e)  $(8 - 3)^2$

m)  $\frac{4^2 + 5^2 - 6 \div 2 \cdot 3}{4^2 - 8 \cdot 2}$

f)  $\sqrt{-49}$

n)  $3 + 2(5 + 3(15 - 2^3) - 2^2 - 1)$

g)  $-\sqrt{49}$

o)  $4(3(2(2^2 - 1) - 1) - 1) + 5$

h)  $-\sqrt{-49}$

3. Simplify each of the following expressions.

a)  $\sqrt{50} - \sqrt{18} + \sqrt{8}$

b)  $\sqrt{\sqrt{36} + 5\sqrt{9} - \sqrt{25}}$

c)  $7\sqrt{20} - 2\sqrt{45} + \sqrt{125}$

4. Let  $p = 4$ ,  $q = 3$ , and  $s = 1$ . Evaluate each of the following expressions.

a)  $\frac{p + q - s}{p - q + s}$

b)  $\frac{2p - q}{p - (q + s)}$

c)  $p^2 - 2s^2$

d)  $p^2 - (2s)^2$

e)  $2pq^2$

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

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

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

c) Based on parts a) and b), 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? (Hint: find  $x^2 + y^2$  and  $(x + y)^2$  on the figure!)

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

