Factoring Polynomials of the Form
$$x^2 + bx + c$$

Name: _____   Date: _____

| **Learning Goal 1.2** | Factor trinomials of the form $ax^2 + bx + c$. |

Assignment – Answers

1. Multiply each pair of binomials. Sketch and label a rectangle to illustrate each product.
   a. $(m + 5)(m + 8)$
      $= m^2 + 13m + 40$
   b. $(y + 9)(y + 3)$
      $= y^2 + 12y + 27$
   c. $(w + 2)(w + 16)$
      $= w^2 + 18w + 32$
   d. $(k + 13)(k + 1)$
      $= k^2 + 14k + 13$

   e. $(g - 3)(g + 7)$
      $= g^2 + 4g - 21$
   f. $(h + 2)(h - 7)$
      $= h^2 + 5h - 14$
   g. $(11 - j)(2 - j)$
      $= j^2 - 13j + 22$
   h. $(k - 3)(k + 11)$
      $= k^2 + 8k - 33$

   i. $(12 + h)(7 - h)$
      $= 84 - 5h - h^2$
   j. $(m - 9)(m + 9)$
      $= m^2 - 81$
   k. $(n - 14)(n - 4)$
      $= n^2 - 18n + 56$
   l. $(p + 6)(p - 17)$
      $= p^2 - 11p + 102$

2. Complete the statements.
   a. $(w + 3)(w + 2)$
      $= w^2 + 5w + 6$
   b. $(x + 5)(x + 2)$
      $= x^2 + 7x + 10$
   c. $(y + 10)(y + 2)$
      $= y^2 + 12y + 20$

3. Factor. Check by expanding.
   a. $x^2 + 10x + 24$
      $= (x + 6)(x + 4)$
   b. $m^2 + 10m + 16$
      $= (m + 8)(m + 2)$
   c. $p^2 + 13p + 12$
      $= (p + 12)(p + 1)$
   d. $s^2 + 12s + 20$
      $= (s + 10)(s + 2)$

   e. $n^2 + 12n + 11$
      $= (n + 11)(n + 1)$
   f. $h^2 + 8h + 12$
      $= (h + 6)(h + 2)$
   g. $q^2 + 7q + 6$
      $= (q + 6)(q + 1)$
   h. $b^2 + 11b + 18$
      $= (b + 9)(b + 2)$

   i. $b^2 + 19b - 20$
      $= (b + 20)(b - 1)$
   j. $t^2 + 15t - 54$
      $= (t - 9)(t - 6)$
   k. $x^2 + 12x - 28$
      $= (x + 14)(x - 2)$
   l. $n^2 - 5n - 24$
      $= (n - 8)(n + 3)$

   m. $a^2 - a - 20$
      $= (a - 5)(a + 4)$
   n. $y^2 - 2y - 48$
      $= (y - 8)(y + 6)$
   o. $m^2 - 15m + 50$
      $= (m - 5)(m - 10)$
   p. $a^2 - 12a + 36$
      $= (a - 6)^2$

   q. $12 + 13k + k^2$
      $= (k + 12)(k + 1)$
   r. $-16 - 6g + g^2$
      $= (g - 8)(g + 2)$
   s. $60 + 17y + y^2$
      $= (y + 12)(y + 5)$
   t. $72 - z - z^2$
      $= (z - 9)(z + 8)$

   u. $4y^2 - 20y - 56$
      $= 4(y - 7)(y + 2)$
   v. $-3m^2 - 18m - 24$
      $= -3(m + 4)(m + 2)$
   w. $4x^2 + 4x - 48$
      $= 4(x + 4)(x - 3)$
   x. $10x^2 + 80x + 120$
      $= 10(x + 6)(x + 2)$

   y. $-5n^2 + 40n - 35 = -5(n - 7)(n - 1)$
   z. $7c^2 - 35c + 42 = 7(c - 3)(c - 2)$