

Name: \_\_\_\_\_

**Concept and Vocabulary Check:**

1. To factor  $x^2 - 12x + 20$ , we must find two integers whose product is \_\_\_\_\_ and whose sum is \_\_\_\_\_.
2. A polynomial is factored \_\_\_\_\_ when it is written as a product of prime polynomials.

**Practice Exercises:**

In exercises 3 - 75 odd, factor each trinomial completely or state that the trinomial is prime. Check 5, 9, 21, 33, 51, and 63 using multiplication.

3.  $x^2 + 7x + 10$

7.  $x^2 - 7x + 12$

5.  $x^2 + 11x + 10$

9.  $x^2 - 12x + 36$

**check:**

**check:**

11.  $y^2 - 8y + 15$

25.  $x^2 - 3x + 6$

13.  $x^2 + 3x - 10$

27.  $w^2 - 30w - 64$

17.  $x^2 - 2x - 15$

29.  $y^2 - 18y + 65$

21.  $x^2 + 4x + 12$

33.  $y^2 - 7y + 5$

**check:**

**check:**

$$43. 3x^2 + 15x + 18$$

$$53. 4x^3 + 12x^2 - 72x$$

$$45. 4y^2 - 4y - 8$$

$$55. 2r^3 + 8r^2 - 64r$$

$$49. 3x^2 - 33x + 54$$

$$61. 2w^4 - 26w^3 - 96w^2$$

$$51. 2r^3 + 6r^2 + 4r$$

$$63. 15xy^2 + 45xy - 60x$$

**check:**

**check:**

$$69. -5x^2 + 50x - 45$$

$$73. -2x^3 - 6x^2 + 8x$$

$$77. (a + b)x^2 + (a + b)x - 20(a + b)$$

$$81. x^2 - \frac{2}{5}x + \frac{1}{25}$$

### Applications:

83. You dive directly upward from a board that is 32 feet high. After  $t$  seconds, your height above the water is described by the polynomial

$$-16t^2 + 16t + 32$$

- a. Factor the polynomial completely.
- b. Evaluate both the original polynomial and its factored form for  $t = 2$ . Do you get the same answer for each evaluation? Describe the meaning of the answer.

### Writing in Mathematics:

85. Explain how to factor  $x^2 + 8x + 15$ .
88. Without actually factoring and without multiplying the given factors, give a reason for which we can tell that the factorization is not correct:

$$x^2 + 46x + 513 = (x - 27)(x - 19)$$