

## Study Guide

**Factoring Using the Distributive Property**

The distributive property has been used to multiply a polynomial by a monomial. It can also be used to express a polynomial in factored form. Compare the two columns in the table below.

Multiplying	Factoring
$3(a + b) = 3a + 3b$	$3a + 3b = 3(a + b)$
$x(y - z) = xy - xz$	$xy - xz = x(y - z)$
$6y(2x + 1) = 6y(2x) + 6y(1)$ $= 12xy + 6y$	$12xy + 6y = 2 \cdot 2 \cdot 3 \cdot x \cdot y + 2 \cdot 3 \cdot y$ $= 6y(2x) + 6y(1)$ $= 6y(2x + 1)$

**Complete.**

1.  $9a + 18b = 9(\text{_____} + 2b)$

2.  $12mn + 80m^2 = 4m(3n + \text{_____})$

3.  $7c^3 - 7c^4 = 7c^3(\text{_____} - c)$

4.  $4xy^3 + 16x^2y^2 = \text{_____}(y + 4x)$

**Factor each polynomial.**

5.  $24x + 48y$

6.  $30mn^2 + m^2n - 6n$

7.  $q^4 - 18q^3 + 22q$

8.  $a + 8a^2b - ab$

9.  $55p^2 - 11p^7 + 44p^5$

10.  $14c^3 - 42c^5 - 49c^4$

11.  $4m + 6n - 8mn$

12.  $14y^3 - 28y^2 + y$

13.  $48w^2z + 18wz^2 - 36wz$

14.  $9x^2 - 3x$

15.  $96ab + 12a^2b - 84ab^3$

16.  $45s^3 - 15s^2$

17.  $18b^2a - 4ba + 7ab^2$

18.  $12p^3q^2 - 18p^2q^2 + 30p$

19.  $-x^5 - 4x^4 + 23x^3 - x$