

Name : _____

Factors: Algebraic Identities

ES1

Factorize each expression using algebraic identities.

1) $x^3 + 15x^2 + 75x + 125$

2) $u^3v^3 - 27u^2v^2 + 243uv - 729$

3) $s^3 + 3s + \frac{3}{s} + \frac{1}{s^3}$

4) $p^3 + 21p^2 + 147p + 343$

5) $g^3 - 3g^2h + 3gh^2 - h^3$

6) $\frac{1}{v^3} - \frac{3w}{v^2} + \frac{3w^2}{v} - w^3$

7) $y^3 - 24y^2 + 192y - 512$

8) $m^3n^3 + 12m^2n^2 + 48mn + 64$

9) $\frac{1}{a^3} + \frac{3}{a^2b} + \frac{3}{ab^2} + \frac{1}{b^3}$

10) $k^3 - 6k^2 + 12k - 8$

Name : _____

Answer key

ES1

Factors: Algebraic Identities

Factorize each expression using algebraic identities.

1) $x^3 + 15x^2 + 75x + 125$

$$(x + 5)^3$$

2) $u^3v^3 - 27u^2v^2 + 243uv - 729$

$$(uv - 9)^3$$

3) $s^3 + 3s + \frac{3}{s} + \frac{1}{s^3}$

$$\left(s + \frac{1}{s}\right)^3$$

4) $p^3 + 21p^2 + 147p + 343$

$$(p + 7)^3$$

5) $g^3 - 3g^2h + 3gh^2 - h^3$

$$(g - h)^3$$

6) $\frac{1}{v^3} - \frac{3w}{v^2} + \frac{3w^2}{v} - w^3$

$$\left(\frac{1}{v} - w\right)^3$$

7) $y^3 - 24y^2 + 192y - 512$

$$(y - 8)^3$$

8) $m^3n^3 + 12m^2n^2 + 48mn + 64$

$$(mn + 4)^3$$

9) $\frac{1}{a^3} + \frac{3}{a^2b} + \frac{3}{ab^2} + \frac{1}{b^3}$

$$\left(\frac{1}{a} + \frac{1}{b}\right)^3$$

10) $k^3 - 6k^2 + 12k - 8$

$$(k - 2)^3$$