

## Special Products

Factor each perfect square trinomial. Always check for the GCF first!

1)  $m^2 + 2m + 1$

$$\sqrt{m^2} = m$$

$$\sqrt{1} = 1$$

$$2(m \cdot 1) = 2m \checkmark$$

$$(m+1)^2$$

2)  $k^2 + 6k + 9$

$$\sqrt{k^2} = k$$

$$\sqrt{9} = 3$$

$$2(k \cdot 3) = 6k \checkmark$$

$$(k+3)^2$$

3)  $r^2 - 4r + 4$

$$\sqrt{r^2} = r$$

$$\sqrt{4} = 2$$

$$2(r \cdot 2) = 4r \checkmark$$

$$(r-2)^2$$

4)  $1 - 2n + n^2$

$$\sqrt{1} = 1$$

$$\sqrt{n^2} = n$$

$$2(1 \cdot n) = 2n \checkmark$$

$$(1-n)^2$$

5)  $25n^2 + 10n + 1$

$$\sqrt{25n^2} = 5n$$

$$\sqrt{1} = 1$$

$$2(5n \cdot 1) = 10n \checkmark$$

$$(5n+1)^2$$

6)  $4v^2 + 20v + 25$

$$\sqrt{4v^2} = 2v$$

$$\sqrt{25} = 5$$

$$2(2v \cdot 5) = 20v \checkmark$$

$$(2v+5)^2$$

7)  $16v^2 - 24v + 9$

$$\sqrt{16v^2} = 4v$$

$$\sqrt{9} = 3$$

$$2(4v \cdot 3) = 24v \checkmark$$

$$(4v-3)^2$$

8)  $\frac{27m^2}{3} + \frac{90m}{3} + \frac{75}{3} = 9m^2 + 30m + 25$

$$3(9m^2 + 30m + 25)$$

$$\sqrt{9m^2} = 3m$$

$$\sqrt{25} = 5$$

$$2(3m \cdot 5) = 30m \checkmark$$

$$\therefore 3(3m+5)^2$$

$$9) \frac{45b^2}{5} - \frac{60b}{5} + \frac{20}{5} = 9b^2 - 12b + 4$$

$$\sqrt{9b^2} = 3b$$

$$\sqrt{4} = 2$$

$$2(3b \cdot 2) = 12b$$

$$5(3b - 2)^2$$

$$11) 25m^2 - 10mn + n^2$$

$$\sqrt{25m^2} = 5m$$

$$\sqrt{n^2} = n$$

$$2(5m \cdot n) = 10mn$$

$$(5m - n)^2$$

$$10) \frac{5x^2}{5} - \frac{40xy}{5} + \frac{80y^2}{5} = x^2 - 8xy + 16y^2$$

$$\sqrt{x^2} = x$$

$$\sqrt{16y^2} = 4y$$

$$2(x \cdot 4y) = 8xy$$

$$5(x - 4y)^2$$

$$12) 9m^2 + 30mn + 25n^2$$

$$\sqrt{9m^2} = 3m$$

$$\sqrt{25n^2} = 5n$$

$$2(3m \cdot 5n) = 30mn$$

$$(3m + 5n)^2$$

**Factor each polynomial (Difference of Squares and Perfect Square Trinomials). Always check for the GCF first!**

$$13) a^2 - 8a + 16$$

$$\sqrt{a^2} = a$$

$$\sqrt{16} = 4$$

$$2(a \cdot 4) = 8a \checkmark$$

$$(a - 4)^2$$

$$14) n^2 - 1 \text{ Difference of Squares}$$

$$\sqrt{n^2} = n$$

$$\sqrt{1} = 1$$

$$(n+1)(n-1)$$

$$15) 9a^2 - 4 \text{ Difference of Squares}$$

$$\sqrt{9a^2} = 3a$$

$$\sqrt{4} = 2$$

$$(3a+2)(3a-2)$$

$$16) 25n^2 + 40n + 16$$

$$\sqrt{25n^2} = 5n$$

$$\sqrt{16} = 4$$

$$2(5n \cdot 4) = 40n \checkmark$$

$$(5n + 4)^2$$

$$17) \frac{45n^2}{5} + \frac{150n}{5} + \frac{125}{5} = 9n^2 + 30n + 25$$

$$\sqrt{9n^2} = 3n$$

$$\sqrt{25} = 5$$

$$2(3n \cdot 5) = 30n \checkmark$$

$$5(3n + 5)^2$$

$$18) \frac{3k^2}{3} - \frac{24k}{3} + \frac{48}{3} = k^2 - 8k + 16$$

$$\sqrt{k^2} = k$$

$$\sqrt{16} = 4$$

$$2(k \cdot 4) = 8k \checkmark$$

$$3(k - 4)^2$$