

Simplify...

$$\begin{aligned} 1. & (x-2)(x+2) \\ & = x^2 + \underline{2x} - \underline{2x} - 4 \\ & = x^2 + \underline{0x} - 4 \\ & = \boxed{x^2 - 4} \end{aligned}$$

$$\begin{aligned} 2. & (x+5)(x-5) \\ & = x^2 - \underline{5x} + \underline{5x} - 25 \\ & = x^2 + \underline{0x} - 25 \\ & = \boxed{x^2 - 25} \end{aligned}$$

What did you notice?

Difference of Squares!

$x^2, y^2, 1, 4, 9, 16, 25, \dots$

Factor:

1. $\underline{x^2} - \underline{16}$
 $(x - 4)(x + 4)$

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

$$\sqrt{16} = 4$$

Difference of Squares!

Factor:

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

$$\sqrt{25} = 5$$

2. $-25 + z^2$

$$\underline{z^2} - \underline{25}$$

$$(z + 5)(z - 5)$$

Try these...

$$1. \underline{x^2} - \underline{100}$$

$$(x - 10)(x + 10)$$

$$2. -36 + y^2$$

$$\underline{y^2} - \underline{36}$$

$$(y + 6)(y - 6)$$

$$3. \underline{81x^2} - \underline{49b^2}$$

$$(9x - 7b)(9x + 7b)$$

$$4. (\underline{Math})^2 - \underline{4}$$

$$(\underline{math} + 2)(\underline{math} - 2)$$

$$5. \left(\frac{9}{64}\right) - \underline{z^2}$$

$$\left(\frac{3}{8} + z\right)\left(\frac{3}{8} - z\right)$$

$$6. \underline{p^{10}} - \underline{64}$$

$$(p^5 - 8)(p^5 + 8)$$

$$\sqrt{p^{10}}$$

$$(p^{10})^{1/2}$$

$$p^{10 \cdot \frac{1}{2}}$$

$$p^5$$

The ultimate question!

$$\underbrace{(x-3)^2}_{\text{term 1}} - \underbrace{25(w+2)^2}_{\text{term 2}}$$

$$\sqrt{(x-3)^2} = x-3$$

$$\sqrt{25(w+2)^2} = 5(w+2)$$

$$(x-3+5(w+2))(x-3-5(w+2))$$

$$\underline{81} - \underline{x^2}$$
$$(9 - x)(9 + x)$$

$$\textcircled{12} \quad -b^2 + 36$$

$$\underline{36} - \underline{b^2}$$

$$(6 + b)(6 - b)$$

$$\textcircled{26} \quad -\frac{1}{4} + \frac{1}{2^2}$$

$$\left(\frac{1}{2^2}\right) - \left(\frac{1}{4}\right)$$

$$\left(\frac{1}{2} + \frac{1}{2}\right)\left(\frac{1}{2} - \frac{1}{2}\right)$$