

Math 45 Examples, 6.4 (Day 1)

Factor completely.

① $49x^2y^2 - 81z^2$

$$a = \sqrt{49x^2y^2} = 7xy$$

$$b = \sqrt{81z^2} = 9z$$

$$a^2 - b^2 = (a-b)(a+b)$$

$$= (7xy - 9z)(7xy + 9z)$$

- two terms
- subtracted
- both are perfect squares

Difference of two squares

$$a^2 - b^2 = (a+b)(a-b)$$

② $\frac{x^2}{25} - \frac{6}{5}x + 9$

$$a = \sqrt{\frac{x^2}{25}} = \frac{x}{5}$$

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

$$a^2 - 2ab + b^2 = (a-b)^2$$

$$= \left(\frac{x}{5} - 3\right)^2$$

check middle term:

$$2(-3)\left(\frac{x}{5}\right) = -\frac{6x}{5} \checkmark$$

- 3 terms
- first and last are perfect squares
- last is added

Perfect square trinomial

$$a^2 - 2ab + b^2 = (a-b)^2$$

③ $4x^2 + 44x + 121$

$$a = \sqrt{4x^2} = 2x$$

$$b = \sqrt{121} = 11$$

$$a^2 + 2ab + b^2 = (a+b)^2$$

$$= (2x + 11)^2$$

check middle term:

$$2(2x)(11) = 44x \checkmark$$

- 3 terms
- first and last are perfect squares
- last is added

Perfect Square Trinomial

$$a^2 + 2ab + b^2 = (a+b)^2$$