

Getting Started – Unit 4Date: Apr. 5/11**Ex. 1a)** Simplify.

$$\begin{aligned} \text{a) } & (5x^2 - 4x + 8) - (2x^2 - 3x + 6) \\ & = 5x^2 - 4x + 8 - 2x^2 + 3x - 6 \\ & = 3x^2 - x + 2 \end{aligned}$$

b)

$$\begin{aligned} & (3x - 2)(3x + 2) \\ & = 9x^2 - 4 \end{aligned}$$

Ex. 2: Factor.

$$\begin{aligned} \text{a) } & 6x^2 - 7x - 3 \\ & = (2x - 3)(3x + 1) \end{aligned}$$

$$\text{b) } 16x^2 - 25$$

$$\text{c) } 4x^2 - 4x + 1 \\ = (2x - 1)^2$$

Ex. 3: What term will make each expression a perfect trinomial square?

$$\begin{aligned} \text{a) } & x^2 + 8x + \square \\ & (x + 4)^2 \end{aligned}$$

$$\begin{aligned} \text{b) } & 4x^2 + \square x + 25 \\ & \square = 20 \end{aligned}$$

$$\begin{aligned} & (2x + 5)^2 \\ & = 4x^2 + 20x + 25 \end{aligned}$$

Ex. 4: Write in factored form.

$$\begin{aligned} \text{a) } f(x) &= -3x^2 - 13x + 10 \\ &= -(3x^2 + 13x - 10) \\ &= -(3x - 2)(x + 5) \end{aligned}$$

$$\begin{aligned} \text{b) } h(x) &= 4x^2 - 49 \\ &= (2x - 7)(2x + 7) \end{aligned}$$

Ex. 5: Determine the vertex of each quadratic function, and state the domain and range of each.

$$\begin{aligned} \text{a) } y &= x^2 + 8x + 7 \\ &= x^2 + 8x + 16 - 16 + 7 \\ &= (x + 4)^2 - 9 \\ &\therefore (-4, -9) \end{aligned}$$

$$D = \{x \in \mathbb{R}\}$$

$$R = \{y \in \mathbb{R} \mid y \geq -9\}$$

$$\begin{aligned} \text{b) } g(x) &= -2x^2 - 12x - 11 \\ &= -2(x^2 + 6x) - 11 \\ &= -2(x^2 + 6x + 9 - 9) - 11 \\ &= -2(x + 3)^2 + (8 - 11) \end{aligned}$$

$$\begin{aligned} &= -2(x + 3)^2 + 7 \\ &\therefore (-3, 7) \\ R &= \{y \in \mathbb{R} \mid y \leq 7\} \end{aligned}$$