

## Unit 2 - Final Exam Review

### 1. Factor

$$\begin{aligned} \text{a) } 2a^3b - 8a^2b \quad \text{GCF} = 2a^2b & \quad \text{b) } 9x^3y^4 + 27xy^2 \quad \text{GCF} = 9xy^2 & \quad \text{c) } -3xy^6 - 15x^2y^2 + 3xy \quad \text{GCF} = -3xy \\ = 2a^2b(a-4) & \quad = 9xy^2(x^2y^2 + 3) & \quad = -3xy(y^5 + 5xy - 1) \end{aligned}$$

$$\begin{aligned} \text{d) } 2y^2x^5 + 2y^6 + 4y \quad \text{GCF} = 2y & \quad \text{e) } 72x^2y^3 - 48x^3y + 80x^2y \quad \text{GCF} = 8x^2y & \quad \text{f) } 18u^7v^5 - 54u^3v^3 - 27uv^2 \quad \text{GCF} = 9uv^2 \\ = 2y(yx^5 + y^5 + 2) & \quad = 8x^2y(9y^2 - 6x + 10) & \quad = 9uv^2(2u^6v^3 - 6u^2v - 3) \end{aligned}$$

$$\begin{aligned} \text{g) } -9a^4b^5 - 12a^2b^3 + 6a^3 \quad \text{GCF} = -3a^2 & \quad \text{h) } 24y^6 + 20y^3 - 80y^2x \quad \text{GCF} = 4y^2 \\ = -3a^2(3a^2b^5 + 4b^3 - 2a) & \quad = 4y^2(by^4 + 5y - 20x) \end{aligned}$$

$$\begin{aligned} \text{i) } -12f^8g^6 + 6f^6g^7 + 12f^7g^5 + 54f^6g^3 \quad \text{GCF} = -6f^6g^3 & \quad \text{j) } -21ab^3 - 21a^2b^2 - 35ab^2 - 14a^4b \quad \text{GCF} = -7ab \\ = -6f^6g^3(2f^2g^3 - g^4 - 2fg^2 - 9) & \quad = -7ab(3b^2 + 3ab + 5b + 2a^3) \end{aligned}$$

### 2. Factor

$$\begin{aligned} \text{a) } x^2 - 9x + 18 & \quad \text{b) } x^2 + x - 42 & \quad \text{c) } n^2 + 9n + 14 \\ = (x-6)(x-3) & \quad = (x+7)(x-6) & \quad = (n+7)(n+2) \end{aligned}$$

$$\begin{aligned} \text{d) } r^2 - r - 12 & \quad \text{e) } 5r^2 + r - 4 & \quad \text{f) } 3k^2 - 7k - 10 \\ = (r-4)(r+3) & \quad = (r+1)(5r-4) & \quad = (3k-10)(k+1) \end{aligned}$$

$$\begin{aligned} \text{g) } 7x^2 + 20x + 12 & \quad \text{h) } 9x^2 + 7x - 2 & \quad \text{i) } 7p^2 - 5p - 2 \\ = (7x+6)(x+2) & \quad = (9x-2)(x+1) & \quad = (p-1)(7p+2) \end{aligned}$$

$$j) 9x^2 - 12x - 32$$

$$= (3x-8)(3x+4)$$

$$k) 4r^2 + 15r - 25$$

$$= (4r-5)(r+5)$$

$$l) 4x^2 + x - 5$$

$$= (x-1)(4x+5)$$

### 3. Factor

$$a) 16x^2 - 9y^2$$

$$= (4x-3y)(4x+3y)$$

$$b) 49x^2 - 25$$

$$= (7x-5)(7x+5)$$

$$c) 4a^2 - 9b^2$$

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

$$d) 225 - 121x^2$$

$$= (15-11x)(15+11x)$$

$$e) 4x^2 + 12x + 9$$

$$= (2x+3)^2$$

$$f) 16x^2 + 24x + 9$$

$$= (4x+3)^2$$

$$g) 25x^2 - 20x + 4$$

$$= (5x-2)^2$$

$$h) 9x^2 - 30x + 25$$

$$= (3x-5)^2$$

$$i) 25x^2 - 10x + 1$$

$$= (5x-1)^2$$

### 4. Expand and simplify

$$a) (x+3)(x+2)$$

$$= x^2 + 5x + 6$$

$$b) (x-4)(x+8)$$

$$= x^2 + 4x - 32$$

$$c) (3a+2)(a-5)$$

$$= 3a^2 - 13a - 10$$

$$d) (2x-5)(4x-7)$$

$$= 8x^2 - 34x + 35$$

$$e) (2p+3)(3p-1)$$

$$= 6p^2 + 7p - 3$$

$$f) (4x-1)^2$$

$$= 16x^2 - 8x + 1$$

$$g) (2b+7)(2b^2-2b-4)$$

$$= 4b^3 + 10b^2 - 22b - 28$$

$$h) (4n+1)(4n^2+3n+8)$$

$$= 16n^3 + 16n^2 + 35n + 8$$

$$i) (3x^2+6x+8)(8x-5)$$

$$= 24x^3 + 33x^2 + 34x - 40$$

$$j) (5x^2 - 6x + 1)(7x - 7)$$

$$= 35x^3 - 77x^2 + 49x - 7$$

$$k) \underline{2(x+3)} + \underline{3(3x-2)}$$

$$= 11x$$

$$l) (x+2)^2 - 4(x+1)$$

$$= x^2$$

$$m) \underline{2x(x-3)} + x - \underline{4(2x+5)}$$

$$= 2x^2 - 13x - 20$$

$$n) 2 + \underline{4(x^2 - 3x + 4)} - \underline{(x+7)^2}$$

$$= 3x^2 + 2x - 31$$

$$2 + 4x^2 - 12x + 16 - (x^2 + 14x + 49)$$

$$3x^2 - 26x - 31$$

5. Find the length if the area =  $2x^2 + 9x - 5$  ← Factor



$$\text{length} = 2x - 1$$

$$\begin{array}{r} 2x^2 + 9x - 5 \\ \underline{2x^2 + 10x - x - 5} \\ \hline 2x(x+5) - 1(x+5) \end{array}$$

$$\begin{array}{r} \frac{10}{10} \times \frac{-1}{-1} = -10 \\ \frac{10}{10} + \frac{-1}{-1} = 9 \end{array}$$

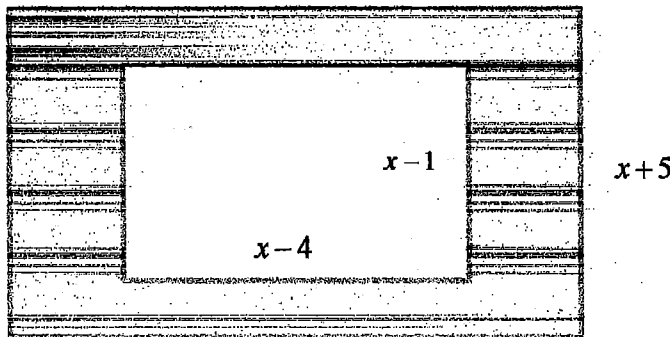
$$(2)(-5) = -10$$

$$= 2x(x+5) - 1(x+5)$$

$$= (x+5)(2x-1)$$

width ↑  
length ↑

6. Find the shaded area. (Write as a polynomial)



$$2x+7$$

$$A = (2x+7)(x+5) - (x-4)(x-1)$$

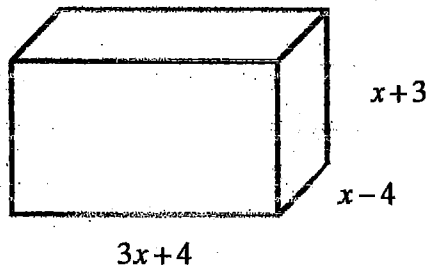
$$= 2x^2 + 10x + 7x + 35 - (x^2 - x - 4x + 4)$$

$$= 2x^2 + 17x + 35 - (x^2 - 5x + 4)$$

$$= 2x^2 + 17x + 35 - x^2 + 5x - 4$$

$$= x^2 + 22x + 31$$

7. Write a polynomial for the volume.



$$V = (3x+4)(x-4)(x+3)$$

$$V = (3x^2 - 12x + 4x - 16)(x+3)$$

$$= (3x^2 - 8x - 16)(x+3)$$

$$= 3x^3 + 9x^2 - 8x^2 - 24x - 16x - 48$$

$$V = 3x^3 + x^2 - 40x - 48$$