

Test #3 In Class Review

1. Determine the degree of the polynomial.

$$6x^3y^4 - 10x^2y^5 + 3xy^2$$

$$\Rightarrow \deg = 7$$

2. Write the polynomial in standard form and state its degree.

$$p^2 - 4p^5 + 7p^3 + 12$$

$$\rightarrow -4p^5 + 7p^3 + p^2 + 12$$

3. Add the polynomials.

$$(9m^4 + 3m^3 - 5m + 6) + (2m^4 - 7m^3 + 8m - 10) = 11m^4 - 4m^3 + 3m - 4$$

4. The height of a rocket is $h = 5t^2 + 15t$. Find how far it travels after 8 seconds.

$$h = 5t^2 + 15t \Rightarrow h(8) = 5(8)^2 + 15(8) = 440$$

5. Evaluate $f(x) = 3x^3 - 2x^2 + 5x - 1$ for $x = -2$.

$$f(x) = 3x^3 - 2x^2 + 5x - 1 \Rightarrow f(-2) = -43$$

6. Subtract the polynomials.

$$(7x^5 - 4x^3 + 9x - 2) - (3x^5 + 8x^3 - 6x + 11) = 4x^5 - 12x^3 + 15x - 13$$

7. Perform the indicated operations.

$$(2y^2 + 3y - 5) + (4y^2 - 7y + 8) - (y^2 - 2y - 3) = 5y^2 - 2y + 6$$

8. Multiply the monomials.

$$(-4a^3b^2)(3a^5b^4) = -12a^8b^6$$

9. Find the product.

$$x^2(2x^3 - 5x + 7) = x^2(2x^3) + x^2(-5x) + x^2(7) = 2x^5 - 5x^3 + 7x^2$$

10. Multiply

	x^2	$4x$	-2
x	x^3	$4x^2$	$-2x$
-3	$-3x^2$	$-12x$	6

$$(x - 3)(x^2 + 4x - 2) = x^3 + x^2 - 14x + 6$$

11. Multiply.

$$(2x + 5y)(x - 3y) = 2x(x - 3y) + 5y(x - 3y) = 2x^2 - xy - 15y^2$$

12. Simplify the product.

$$2 \cdot x \cdot 4 = 8x$$

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

$$(x^2 - 4) - (x^2 + 8x + 16) = -8x - 20$$

13. Find and simplify

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

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

$$f(a+h) - f(a), \text{ given } f(x) = x^2 - 4x + 1.$$

$$f(a+h) = (a+h)^2 - 4(a+h) + 1$$

$$f(a) = a^2 - 4a + 1$$

$$= a^2 + 2ah + h^2 - 4a - 4h + 1$$

$$f(a+h) - f(a) = \cancel{a^2} + 2ah + h^2 - \cancel{4a} - 4h + \cancel{1} - \cancel{a^2} + \cancel{4a} - \cancel{1} = h^2 + 2ah - 4h$$

14. Factor the polynomial completely

$$\underbrace{x^3 + 10x^2}_{\text{orange}} + \underbrace{5x + 50}_{\text{green}} = x^2(\underbrace{x + 10}_{\text{purple}}) + 5(\underbrace{x + 10}_{\text{purple}}) \\ = (\underbrace{x + 10}_{\text{purple}})(\underbrace{x^2 + 5}_{\text{yellow}})$$

15. Factor out the GCF.

$$9x^4 + 15x^3 = 3x^3(3x + 5)$$

16. Factor completely.

$$p^2 - 36 = p^2 - 6^2 = (p + 6)(p - 6)$$

17. Factor out a greatest common factor

$$a_1 + a_2 = -2 \quad \begin{matrix} 1+3=4 \neq -2 \\ 1+3=4 \neq -2 \end{matrix}$$

$$a_1 a_2 = 3 \quad \begin{matrix} 1 \cdot 3 \\ -1 \cdot (-3) \end{matrix}$$

$$-12r^3 + 8r^2 - 4r = -4r(3r^2 - 2r + 1)$$

18. Factor completely.

$$a_1 + a_2 = -11$$

$$a_1 a_2 = 28 = -4(-7)$$

$$x^2 - 11x + 28 = \underbrace{x^2 - 4x}_{\text{orange}} - \underbrace{7x + 28}_{\text{green}} \\ = x(x - 4) - 7(x - 4) = (x - 4)(x - 7)$$

19. Factor completely.

$$a^3 + 3a^2 - 10a$$

20. Write as a product of prime polynomials.

$$12x^2 + 20x + 8$$

$$4(3x^2 + 5x + 2)$$

$$a_1 + a_2 = 5$$

$$a_1 a_2 = 6$$

$$4 \left[\underbrace{3x^2 + 2x}_{\text{orange}} + \underbrace{3x + 2}_{\text{green}} \right]$$

$$= 4 \left[\underbrace{x(3x + 2)}_{\text{orange}} + \underbrace{1(3x + 2)}_{\text{green}} \right] = 4(3x + 2)(x + 1)$$

$$a(a^2 + 3a - 10)$$

$$a_1 + a_2 = 3$$

$$a_1 a_2 = -10$$

$$= -1 \times 10$$

$$= -2 \times 5$$

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

Answer Key

1. Degree = 7 (from x^2y^5 term)
2. Standard form: $-4p^5 + 7p^3 + p^2 + 12$; Degree = 5
3. $11m^4 - 4m^3 + 3m - 4$
4. $h(8) = 5(8)^2 + 15(8) = 440$ meters
5. $f(-2) = -43$
6. $4x^5 - 12x^3 + 15x - 13$
7. $5y^2 - 2y + 6$
8. $-12a^8b^6$
9. $2x^5 - 5x^3 + 7x^2$
10. $x^3 + x^2 - 14x + 6$
11. $2x^2 - xy - 15y^2$
12. $-8x - 20$
13. $2ah + h^2 - 4h$
14. $(x + 10)(x^2 + 5)$
15. $3x^3(3x + 5)$
16. $(p - 6)(p + 6)$
17. $-4r(3r^2 - 2r + 1)$
18. $(x - 7)(x - 4)$
19. $a(a + 5)(a - 2)$
20. $4(3x + 2)(x + 1)$