

Section 5.2 - Multiplying Polynomials

5.1 Last time - adding $(\underline{3x^2} + \underline{2x}) + (\underline{7x^2} - \underline{x})$
 $= 10x^2 + x$
 $x + x = 2x$

multiply

$$x^1 \cdot x^1 = x^2$$

$$3x^2 \cdot 2x^1 = 6x^3$$

ex:

$$4. y^1 \cdot y^{19} = y^{20}$$

$$6. x^4 \cdot x^3 \cdot x^5 = x^{12}$$

$$10. (6^7)^{10} = 6^{70}$$

$$14. [(-50)^4]^4$$

even number of negatives = $(50^4)^4 = 50^{16}$

$$16. (4x)^3 = 4^3 x^3 = 64x^3$$

Exponent Rules

① Product Rule $x^2 \cdot x^3 = x^{2+3} = x^5$
 $x \cdot x \cdot x \cdot x \cdot x =$

② Power Rule $(x^2)^3 = x^{2 \cdot 3} = x^6$
 $x^2 \cdot x^2 \cdot x^2$
 $x \cdot x \cdot x \cdot x \cdot x \cdot x$

When you have a power to a power you multiply the exponents.

③ Distributing Power Rule $(2t^2)^3 = 2^3 t^{2 \cdot 3} = 8t^6$

ex: $(2t)^2 = 2^2 t^2 = 4t^2$

$$\begin{aligned} 24. \quad & \overbrace{(-2x^{11})^5} \\ & = (-2)^5 x^{55} \\ & = -2^5 x^{55} \\ & = -32 x^{55} \end{aligned}$$

$$\begin{aligned} 26. \quad & (\underline{8}x^1)(\underline{3}x^1) \\ & = 24x^2 \end{aligned}$$

$$\begin{aligned} 30. \quad & (-6y^4)(2y^3) \\ & = -12y^7 \end{aligned}$$

$$6(x+5) = 6x + 30$$

$$\begin{aligned} 36. \quad & \overbrace{6x(x+5)} \\ & = 6x^2 + 30x \end{aligned}$$

$$\begin{aligned} 44. \quad & 5x^2(x+6) \\ & = 5x^3 + 30x^2 \end{aligned}$$

$$\begin{aligned} 54. \quad & -6x^2(3x^2 - 2x - 7) \\ & -18x^4 + 12x^3 + 42x^2 \end{aligned}$$

$$(-6x)^2$$

Mth 65 Required Course Supplement

Supplement to §5.2

In Class:

1. Let $f(x) = 3x^2 - 2x + 7$

a. Find $f(1)$

$$\begin{aligned} f(1) &= 3(1)^2 - 2(1) + 7 \\ &= 3 \cdot 1 - 2 + 7 \\ &= 3 - 2 + 7 \\ &= 1 + 7 = 8 \end{aligned}$$

b. Find $f(0)$

$$\begin{aligned} f(0) &= 3(0)^2 - 2(0) + 7 \\ &= 3 \cdot 0 - 0 + 7 \\ &= 0 + 0 + 7 \\ &= 7 \end{aligned}$$

c. Find $f(-2)$

$$\begin{aligned} f(-2) &= 3(-2)^2 - 2(-2) + 7 \\ &= 3 \cdot 4 + 4 + 7 \\ &= 12 + 4 + 7 \\ &= 16 + 7 \\ &= 23 \end{aligned}$$

2. Let $h(t) = (t-4)(t+5)$ $f(1) = 8$

a. Find $h(4)$

$$\begin{aligned} h(4) &= (4-4)(4+5) \\ &= 0(9) \\ &= 0 \end{aligned}$$

b. Find $h(0)$

$$\begin{aligned} h(0) &= (0-4)(0+5) \\ &= (-4)(5) \\ &= -20 \end{aligned}$$

c. Find $h\left(\frac{1}{2}\right)$

$$\begin{aligned} h\left(\frac{1}{2}\right) &= \left(\frac{1}{2} - 4\right)\left(\frac{1}{2} + 5\right) \\ &= \left(\frac{1}{2} - \frac{8}{2}\right)\left(\frac{1}{2} + \frac{10}{2}\right) \\ &= \left(-\frac{7}{2}\right)\left(\frac{11}{2}\right) \\ &= -\frac{77}{4} \end{aligned}$$

Homework:

1.) Let $f(x) = x^2 + \frac{1}{3}x + \frac{4}{5}$ and $g(h) = \left(h - \frac{3}{4}\right)(h+8)$. Evaluate and simplify the expressions using correct formatting.

a.) $f(-3)$

b.) $g\left(-\frac{5}{4}\right)$

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a. Find $f(1)$

b. Find $f(0)$

c. Find $f(-2)$

2. Let $h(t) = (t - 4)(t + 5)$

a. Find $h(4)$

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Mth65 Supplement Key

§5.2

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a.) $f(-3) = \frac{44}{5}$

b.) $g\left(-\frac{5}{4}\right) = -\frac{27}{2}$