

Section 5.1a – Practice Problems

EMERGING LEVEL QUESTIONS

For each polynomial, find the number of terms, the degree, and coefficients of each term

<p>1. $3x^5$</p> <p>term: 1 degree: 5 coefficient: 3</p>	<p>2. $-2y^4$</p> <p>t: 1 d: 4 c: -2</p>	<p>3. $4x^3 - 2x^2$</p> <p>t: 2 d: 3, 2 c: 4, -2</p>
<p>4. $-3a^3 + 3a - 4^0$</p> <p>t: 3 d: 3, 1, 0 c: -3, 3, -4</p>	<p>5. $2x^3y^2 - 3x^2$</p> <p>t: 2 d: 2, 5 c: 2, -3</p>	<p>6. $2^3b^3 - 3^2$</p> <p>t: 2 d: 3, 0 c: 8, -9</p>
<p>7. $-x^3y^2z + \sqrt{2}xyz + 4z^3$</p> <p>t: 3 d: 6, 3, 3 c: -1, $\sqrt{2}$, 4</p>	<p>8. $\sqrt[3]{2}x^4y^3z^2p + p$</p> <p>t: 2 d: 10, 1 c: $\sqrt[3]{2}$, 1</p>	<p>9. x^3</p> <p>t: 1 d: 3 c: 1</p>

For each polynomial, simplify, then write the answer in descending order

10. $3x^2 - 2x + 5x - x^2$

$3x^2 - x^2 - 2x + 5x$

$2x^2 + 3x$

11. $\frac{2}{3}x^4 + \frac{4}{3}x^4$

$\frac{6}{3}x^4 \rightarrow 2x^4$

12. $2.3x^2 + 3 - 4.1x^2 + 3x$

$$-1.8x^2 + 3x + 3$$

13. $3y^4 - 2y^2 - y^4 - 2y$

$$2y^4 - 2y^2 - 2y$$

14. $-2x^3 - 2x^2 - 2x^3 + 2x^2$

$$-4x^3$$

15. $x^2 - 2x + x^3 + x$

$$x^3 + x^2 - x$$

PROFICIENT LEVEL QUESTIONS

16. $2x^2 - \frac{3}{4}x^3 + 6x^2 + \frac{2}{3}x^3$

$$-\frac{9}{12}x^3 + \frac{8}{12}x^3 \quad 2x^2 + 6x^2$$

$$\frac{-1}{12}x^3 + 8x^2$$

17. $-4y^3 - \frac{1}{2}y^5 + 5y^3 - \frac{1}{3}y^5$

$$-\frac{3}{6}y^5 - \frac{2}{6}y^5 - 4y^3 + 5y^3$$

$$-\frac{5}{6}y^5 + y^3$$

18. $\frac{1}{3}x - \frac{1}{2}x + x^2 + \frac{1}{3}x^2$

$$\frac{3}{3}x^2 + \frac{1}{3}x^2 + \frac{2}{6}x - \frac{3}{6}x$$

$$\boxed{\frac{4}{3}x^2 - \frac{1}{6}x}$$

19. $\sqrt{16}y - \frac{2}{3}y - y^3 - \frac{1}{4}y^2$

$$4y \rightarrow \frac{12}{3}y$$

$$\boxed{-y^3 - \frac{1}{4}y^2 + \frac{10}{3}y}$$

Find the value of the polynomial when $x = -2$

20. $-3x^2 + 2x - 1$

$$-3(-2)^2 + 2(-2) - 1$$

$$-12 - 4 - 1$$

$$\boxed{-17}$$

21. $-3x^2 - 2x + 1$

$$-3(-2)^2 - 2(-2) + 1$$

$$-12 + 4 + 1$$

$$\boxed{-7}$$

22. $2x^2 - 3x + 4$

$$2(-2)^2 - 3(-2) + 4$$

$$8 + 6 + 4$$

$$\boxed{18}$$

23. $-2x^2 - 3x - 4$

$$-2(-2)^2 - 3(-2) - 4$$

$$-8 + 6 - 4$$

$$\boxed{-6}$$

24. $-x^4 + 2x^2 - 3$
 $-(-2)^4 + 2(-2)^2 - 3$
 $-16 + 8 - 3$
 -11

25. $x^4 - 2x^2 + 3$
 $(-2)^4 - 2(-2)^2 + 3$
 $16 - 8 + 3$
 11

26. $-x^5 - 3x^3$
 $-(-2)^5 - 3(-2)^3$
 $-(-32) - 3(-8)$
 $32 + 24$
 56

27. $-x^4 - 3x^2$
 $-(-2)^4 - 3(-2)^2$
 $-(16) - 3(4)$
 $-16 - 12$
 -28

Find each product.

28. $3x^3(2x^4)$
 $3 \cdot 2 \cdot x^3 \cdot x^4$
 $6x^7$

29. $-2a^2b^4(4ab^2)$
 $-2 \cdot 4 \cdot a^2 \cdot a \cdot b^4 \cdot b^2$
 $-8a^3b^6$

30. $(3xy)(-4x^2y^2)$
 $3 \cdot -4 \cdot x \cdot x^2 \cdot y \cdot y^2$
 $-12x^3y^3$

31. $(2ab)(-2ab)(2ab)$
 $2 \cdot -2 \cdot 2 \cdot a \cdot a \cdot a \cdot b \cdot b \cdot b$
 $-8a^3b^3$

32. $(5x^3)(-2y^3)$

$$5 \cdot -2 \cdot x^3 \cdot y^3$$

$$\boxed{-10x^3y^3}$$

33. $(-4a^4b^3)(2a^3b^2)(3ab)$

$$-4 \cdot 2 \cdot 3 \cdot a^4 \cdot a^3 \cdot a \cdot b^3 \cdot b^2 \cdot b$$

$$\boxed{-24a^8b^6}$$

34. $(a^2b^4)(a^3b)(-3b^2)$

$$-3 \cdot a^2 \cdot a^3 \cdot b^4 \cdot b \cdot b^2$$

$$\boxed{-3a^5b^7}$$

35. $(-r^4s^2t)(r^3st^2)(-rst)$

$$-r^4 \cdot r^3 \cdot r \cdot s^2 \cdot s \cdot s \cdot t \cdot t^2 \cdot t$$

$$\boxed{r^8s^4t^4}$$

36. $(-3ab^2)(2a^3b)(-a^2b^2)(-2a^3b^2)$

$$-3 \cdot 2 \cdot 1 \cdot 2 \cdot a \cdot a^3 \cdot a^2 \cdot a^3 \cdot b^2 \cdot b \cdot b^2 \cdot b^2$$

$$\boxed{-12a^9b^7}$$

37. $(-5a^3b^3c^2d^3)(-2ab^2cd^2)(-4a^2bc^3d)$

$$-5 \cdot 2 \cdot 4 \cdot a^3 \cdot a \cdot a^2 \cdot b^3 \cdot b^2 \cdot b \cdot c^2 \cdot c \cdot c^3 \cdot d^3 \cdot d^2 \cdot d$$

$$\boxed{-40a^6b^6c^6d^6}$$

Find each product. Leave the answer in descending order.

38. $3x(x-4)$

$$3x \cdot x - 3x \cdot 4$$

$$\boxed{3x^2 - 12x}$$

39. $-2x^2(x+3)$

$$-2x^2 \cdot x + (-2x^2)3$$

$$\boxed{-2x^3 - 6x^2}$$

$$40. 4y(-2y^2 + 3y)$$

$$4y \cdot 2y^2 + 4y \cdot 3y$$

$$8y^3 + 12y^2$$

$$41. -5y(2y + 3y^2 - y^4)$$

$$-5y \cdot 2y + (-5y) \cdot 3y^2 - (-5y) \cdot y^4$$

$$-10y^2 - 15y^3 + 5y^5$$

$$5y^5 - 15y^3 - 10y^2$$

$$42. (3a^2)(2a)(-4 + 2a^2 - a^4)$$

$$3a^2 \cdot 2a (-4 + 2a^2 - a^4)$$

$$6a^3 (-4 + 2a^2 - a^4)$$

$$6a^3 \cdot (-4) + 6a^3 \cdot 2a^2 - 6a^3 \cdot a^4$$

$$-24a^3 + 12a^5 - 6a^7$$

$$-6a^7 + 12a^5 - 24a^3$$

$$43. -2mn^4(-2mn + 3m^2n^2 - 4)$$

$$-2mn^4(-2mn) + (-2mn^4) \cdot 3m^2n^2 - (-2mn^4) \cdot 4$$

$$4m^2n^5 - 6m^3n^6 + 8mn^4$$

$$-6m^3n^6 + 4m^2n^5 + 8mn^4$$

EXTENDING LEVEL QUESTIONS

$$44. a^2bc(ab^2c^2 - a^2bc^2 - 2a^3b^3c)$$

$$a^2bc(ab^2c^2) - a^2bc(a^2bc^2) - a^2bc(2a^3b^3c)$$

$$a^3b^3c^3 - a^4b^2c^3 - 2a^5b^4c^2$$

$$-2a^5b^4c^2 - a^4b^2c^3 + a^3b^3c^3$$

$$45. -abc^2(-a^2bc^3 + ab^2c - a^3c^2)$$

$$+abc^2(a^2bc^3) + abc^2(ab^2c) - a^3c^2(-abc^2)$$

$$a^3b^2c^5 - a^2b^3c^3 + a^4b^2c^4$$

$$a^3b^2c^5 + a^4b^2c^4 - a^2b^3c^3$$

46. $(-x^2y)(xy^3)(xy - xy^2 + x^2y^2)$

$$-x^3y^4(xy - xy^2 + x^2y^2)$$

$$-x^4y^5 + x^4y^6 - x^5y^6$$

$$-x^5y^6 + x^4y^6 - x^5y^6$$

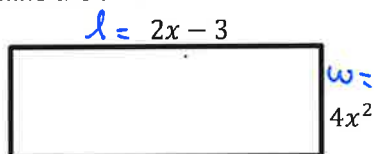
47. $(-a^3b^2)(-a^2b)(-a^2b - a^2b^3 + a^3b)$

$$a^5b^3(-a^2b - a^2b^3 + a^3b)$$

$$-a^7b^4 - a^7b^6 + a^8b^4$$

$$-a^7b^6 + a^8b^4 - a^7b^4$$

48. Determine the area



Area = $l \cdot w$

$l = 2x - 3$

$w = 4x^2$

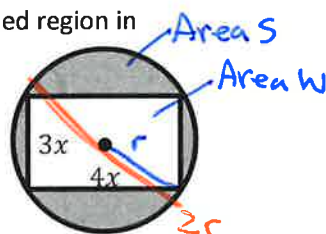
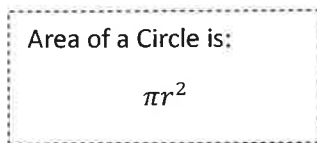
so, $l \cdot w = \text{Area}$

$(2x - 3)(4x^2) = \text{Area}$

$2x \cdot 4x^2 - 3 \cdot 4x^2 = \text{Area}$

$8x^3 - 12x^2 = \text{Area}$

49. Determine the area of the shaded region in terms of $x, y,$ and π



$\text{Area } S = \pi r^2 - \text{Area } W$

$\text{Area } W = l \cdot w$

$l = 4x$

$w = 3x$

so, $\text{Area } W = 4x \cdot 3x$

$\text{Area } W = 12x^2 \rightarrow \text{Area } S = \pi r^2 - \text{Area } W$

$\text{Area } W = \pi \left(\frac{9x^2 + 16x^2}{2} \right) - 12x^2$

$\text{Area } W = \pi(4x^2 + 4x^2) - 12x^2$

$\text{Area } W = \frac{9}{4} \pi x^2 + \frac{16}{4} \pi x^2 - 12x^2$

$\text{Area } W = \frac{25}{4} \pi x^2 - 12x^2$

$\text{Area } W = 6.25\pi x^2 - 12x^2$

to find r

$a^2 + b^2 = c^2$

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

$\sqrt{9x^2 + 16x^2} = 2r$

$\frac{\sqrt{9x^2 + 16x^2}}{2} = r$