Mth 096 – Beginning Algebra – **Practice Exam 5 - Solutions**

1. $y^4 y^3 = y^{4+3} = y^7$

2. $\dfrac{a^4 b^3}{a^6 b^2} = a^{4-6} b^{3-2} = a^{-2} b = \dfrac{1}{a^2} b = \dfrac{b}{a^2}$

3. $\left(3x^3 y^4\right)^2 = 3^2 \left(x^3\right)^2 \left(y^4\right)^2 = 9x^{3\cdot 2} y^{4\cdot 2} = 9x^6 y^8$

4. $\left(\dfrac{1200 x^{-5} y^{-7} z^{26}}{35 x^{-2} y z^{15}}\right)^0 = 1$

5. $\dfrac{\left(-x^2\right)^4}{-\left(x^3\right)^{-2}} = \dfrac{x^8}{-x^{-6}} = -x^{8-(-6)} = -x^{14}$

6. $\dfrac{-3^2 + 5^2}{-2^2} = \dfrac{-9+25}{-4} = \dfrac{16}{-4} = -4$

7. $\left(\dfrac{m^3}{m^5}\right)^{-2} = \left(m^{3-5}\right)^{-2} = \left(m^{-2}\right)^{-2} = m^{(-2)(-2)} = m^4$

8.
   a. $0.000\ 000\ 043 = 4.3 \times 10^{-8}$
   b. $56{,}300{,}000 = 5.63 \times 10^7$

9.
   a. $1.54 \times 10^5 = 154{,}000$
   b. $2.34 \times 10^{-4} = 0.000\ 234$

10.
   a. $\left(3 \times 10^{-5}\right)\left(6 \times 10^{10}\right) = (3 \cdot 6) \times \left(10^{-5} 10^{10}\right) = 18 \times 10^5 = 18{,}000$
   b. $\dfrac{9 \times 10^{-7}}{3 \times 10^{-4}} = \dfrac{9}{3} \times \dfrac{10^{-7}}{10^{-4}} = 3 \times 10^{-7-(-3)} = 3 \times 10^{-4} = 0.000\ 3$

11.

a. There are 3 terms.

b. 4, 3, 0

c. The leading coefficient is 1.

d. 4

12. The terms are degree 4, 3, and 5, respectively, so the degree of the polynomial is 5. (the largest)

13. $\begin{aligned}&\left(5w^4 - w^3 - w\right) - \left(2w^3 - 3w^2 - 5w\right)\\ &= 5w^4 - w^3 - w - 2w^3 + 3w^2 + 5w\\ &= 5w^4 - 3w^3 + 3w^2 + 4w\end{aligned}$

14. The area of the entire rectangle is 80, and the area of each square being cut out is $x \cdot x = x^2$. Since there are 4 squares being cut out, the remaining area is $80 - 4x^2$

15. $\begin{aligned}&(x+2)(x-3)\\ &= x^2 - 3x + 2x - 6\\ &= x^2 - x - 6\end{aligned}$

16. $(y+5)(y-5) = y^2 - 25$

17. $(a+3)^2 = (a+3)(a+3) = a^2 + 6a + 9$

18. $\begin{aligned}&(3y+4)(2y-5)\\ &= 6y^2 - 15y + 8y - 20\\ &= 6y^2 - 7y - 20\end{aligned}$

19. $\begin{aligned}&(x-5)(x^2 + 2x - 1)\\ &= x(x^2 + 2x - 1) - 5(x^2 + 2x - 1)\\ &= x^3 + 2x^2 - x - 5x^2 - 10x + 5\\ &= x^3 - 3x^2 - 11x + 5\end{aligned}$

20. $\dfrac{4x^3y + 2xy^2}{x^2y} = \dfrac{4x^3y}{x^2y} + \dfrac{2xy^2}{x^2y} = 4x + \dfrac{2y}{x}$

21.

$$x-1\overline{)\,x^2+5x-6}\qquad x+6$$

$$\begin{array}{r} x^2-x \\ \hline 6x-6 \\ 6x-6 \\ \hline 0 \end{array}$$

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so $\dfrac{x^2+5x-6}{x-1}=x+6$

22.

$$x+2\overline{)\,x^3+\_\_\_+6x-5}\qquad x^2-2x+10$$

$$\begin{array}{r} x^3+2x^2 \\ \hline -2x^2+6x \\ -2x^2-4x \\ \hline 10x-5 \\ 10x+20 \\ \hline -25 \end{array}$$

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so $\dfrac{x^3+4x-5}{x+2}=x^2-2x+10-\dfrac{25}{x+2}$