16.4 Exercises Pg. 732 # 16, 27 (# 32, 34 optional) [ANSWER KEY]

16. $\dfrac{(1.5)^2}{(1.5)^{-2} \bullet (1.5)^4} = \dfrac{(1.5)^2}{(1.5)^{-2+4}}$

$= \dfrac{(1.5)^2}{(1.5)^2}$

$= (1.5)^{2-2}$

$= (1.5)^0$

$= \boxed{1}$

27. $\dfrac{3^{-2} \bullet k^0 \bullet w^0}{w^{-6}} = \dfrac{3^{-2} \bullet 1 \bullet 1}{w^{-6}} = \dfrac{w^6}{3^2} = \boxed{\dfrac{w^6}{9}}$

32. $\dfrac{\text{meter}}{\text{micrometer}} = \dfrac{1 \text{ m}}{10^{-6} \text{ m}}$

$= \dfrac{10^0}{10^{-6}}$

$= 10^{0-(-6)}$

$= 10^6$

$= 1{,}000{,}000$

There are $\boxed{1{,}000{,}000 \text{ micrometers}}$ in a meter.

16.4 Exercises Pg. 732 # 16, 27 (# 32, 34 optional) [ANSWER KEY]

34. a. $\dfrac{500}{10^{-3}} = 500 \bullet 10^3 \text{ mm}^3$

The donation is $500 \bullet 10^3$ cubic millimeters.

$$\begin{aligned} 500 \bullet 10^3 \bullet 10^4 &= 500 \bullet 10^{3+4} \\ &= 500 \bullet 10^7 \\ &= 500 \bullet 10{,}000{,}000 \\ &= 5{,}000{,}000{,}000 \end{aligned}$$

There are about five billion white blood cells in the donation.

b. $$\begin{aligned} 500 \times 10^3 \times 5 \times 10^6 &= 500 \times 5 \times 10^3 \times 10^6 \\ &= 2500 \times 10^{3+6} \\ &= 2500 \times 10^9 \\ &= 2500 \times 1{,}000{,}000{,}000 \\ &= 2{,}500{,}000{,}000{,}000 \end{aligned}$$

There are about two trillion five hundred billion red blood cells in the donation.

c. The ratio of red blood cells to white blood cells is $\dfrac{2{,}500{,}000{,}000{,}000}{5{,}000{,}000{,}000} = \dfrac{500}{1}$. There are about 500 times more red blood cells than white blood cells.