

7-4

$$\textcircled{1} \frac{5^6}{5^2} = 5^{6-2} = 5^4 = 625$$

$$\textcircled{2} \frac{5^5}{5^2} = 5^{5-2} = 5^3 = 125$$

$$\textcircled{3} \frac{x^{\frac{5}{8}}}{x^{\frac{3}{8}}} = x^{\frac{5}{8} - \frac{3}{8}} = x^{\frac{2}{8}} = x^{\frac{1}{4}}$$

$$\textcircled{4} \frac{m^{-3}}{m^{-5}} = m^{-3 - (-5)} = m^2$$

$$\textcircled{5} \frac{x^6 y^9}{x^2 y^5} = x^{6-2} y^{9-5} = x^4 y^4$$

$$\textcircled{6} \frac{21m^{\frac{3}{4}}}{3m^{\frac{1}{4}}} = 7m^{\frac{3}{4} - \frac{1}{4}} = 7m^{\frac{2}{4}} = 7m^{\frac{1}{2}}$$

$$\textcircled{7} \left(\frac{3}{5}\right)^4 = \frac{3}{5} \cdot \frac{3}{5} \cdot \frac{3}{5} \cdot \frac{3}{5} = \frac{3^4}{5^4} = \frac{81}{625}$$

$$\textcircled{8} \left(\frac{3x}{2y}\right)^3 = \frac{3x}{2y} \cdot \frac{3x}{2y} \cdot \frac{3x}{2y} = \frac{27x^3}{8y^3}$$

$$\textcircled{9} \left(\frac{4}{7}\right)^{-2} = \left(\frac{4^{-2}}{7^{-2}}\right) \text{ or } \frac{1}{\frac{1}{49}} = \frac{1}{16} \cdot \frac{49}{1} = \frac{49}{16}$$

(dividing fractions)

$$(10) \left( \frac{-3x^4}{2y^5} \right)^{-3} = \frac{3^{-3} x^{-12}}{2^{-3} y^{-15}} = \frac{\frac{1}{3^3 x^{12}}}{\frac{1}{8y^{15}}} = \frac{1}{3x^{12}} \cdot 8y^{15} = \frac{8y^{15}}{27x^{12}}$$

$$(11) \left( \frac{12p^{\frac{3}{2}}}{15p} \right)^4 = \frac{12^4 p^{\frac{3}{2} \cdot 4}}{15^4 p^4} = \frac{20,736 p^6}{50,625 p^4} \div 81 = \frac{256 p^2}{625 p^4} = \frac{256 p^2}{625}$$

$$(12) \left( \frac{ab^3}{a^5b} \right)^{-2} = \frac{a^{-2} b^{-6}}{a^{-10} b^{-2}} = a^{-2-(-10)} b^{-6-(-2)} = a^8 b^{-4} = \frac{a^8}{b^4}$$

$$(13) \left( \frac{3x^2 y^5 z^{-2}}{5x z^5} \right)^{-3} = \frac{3^{-3} x^{-6} y^{-15} z^6}{5^{-3} x^{-3} z^{-15}} = \frac{3^{-3} x^{-6-(-3)} y^{-15} z^{6-(-15)}}{5^{-3}}$$

$$= \frac{3^{-3} x^{-3} y^{-15} z^{21}}{5^{-3}}$$

$$\frac{5^3 z^{21}}{3^3 x^3} = \frac{125 z^{21}}{27 x^3 y^{15}}$$

$$(14) \frac{(4m^2)(3n^5)}{(2m^{-3})(-mn)^3} = \frac{12m^2 n^5}{2m^{-3} \cdot -m^3 n^3} = \frac{12m^2 n^5}{-2m^0 n^3} = \frac{12m^2 n^5}{-2n^3} = -6m^2 n^2$$

$$(15) 2^4 r^3 = 16r^3 \quad (16) (3x)^2 = 9x^2$$

$$(17) m^3 n^0 = m^3 \quad (18) \frac{y^5}{y} = y^4$$

$$(19) \frac{3.6 \times 10^7}{1.5 \times 10^3} = 2.4 \times 10^4$$

$$(20) \frac{4.5 \times 10^{-6}}{5 \times 10^{-2}} = \frac{.9 \times 10^{-4}}{9 \times 10^{-5}}$$

(21) work separately

Divide #s or coefficients

Divide powers by subtracting exp

$$(22) \frac{3 \times 10^2 \text{ sec}}{6.8 \times 10^{-9} \text{ sec}} = .44117 \times 10^{11} \Rightarrow 4.4117 \times 10^{10}$$

$$60 \text{ sec} \times 5 \text{ min} = 300 \text{ sec} \Rightarrow 3 \times 10^2 \text{ sec}$$

$$(23) \left(\frac{6^4}{3^2}\right)^3 = \left[6 \div 3\right]^{4 \cdot 3} = (2^2)^3 = 64$$

different bases: you can't divide them!

$$(24) \frac{2^3}{2^1} = \frac{\cancel{2} \cdot 2 \cdot 2}{\cancel{2}} = 2^2$$

$$\frac{2^3}{3^1} = \frac{2 \cdot 2 \cdot 2}{3} = \text{can't cancel anything out}$$

$$(25) \triangle \quad A = 80x^5y^3 \quad A = \frac{b \times h}{2}$$

$$80x^5y^3 = \frac{b \times h}{2}$$

$$\text{solve } 2 \cdot 80x^5y^3 = \frac{b \times h}{2} \cdot 2$$

$$\frac{160x^5y^3}{x^4y} = \frac{b \times h}{x^4y}$$

$$160xy^2 = b$$

$$(26) \left( \frac{12m^5}{15m} \right)^3 = \frac{12^3 m^{15}}{15^3 m^3} = \frac{1,728 m^{12}}{3,375} \div \frac{27}{27} = \frac{64m^{12}}{125}$$

7-4

$$(1) \frac{x^5 y^2}{x^1 y^{1/2}} = x^4 y^{3/2} \quad (D)$$

$$(2) (F) 5 \left( \frac{5^3}{\frac{2}{5}} \right)^2 = 5 \left( \frac{(5^3)^2}{(\frac{2}{5})^2} \right) = 5 \left( \frac{5^6}{\frac{4}{10}} \right) = 5 \left( \frac{15,625}{.4} \right)$$

$$5(39,062.5) = 195,312.5$$

$$(3) \frac{(6x)^5}{(6x)^5 y} = 36 \cdot \frac{1}{6^5 x^5} = 6^2 \cdot \frac{1}{6^5 x^5} = \frac{6^2}{6^5 x^5} = \frac{1}{6^3 x^5}$$

*rewrite as 6<sup>2</sup>*

$$\frac{36}{6x^5} = \frac{6}{x^5} \quad (B)$$

(7)

$$A = 12x^3y^4$$

3xy

$$\frac{12x^3y^4}{3xy} = 4x^2y^3$$

$$(4) 4.5 \times 10^9 \quad (G)$$

$$(5) (B)$$

$$(6) (I)$$