

# Test Review - 8.1, 8.2, 7.2-7.5

$$1) \frac{m-7}{8m^2-56m} = \frac{\cancel{m-7}}{8m(\cancel{m-7})} = \boxed{\frac{1}{8m}} \quad \begin{matrix} 8m \neq 0 \\ m \neq 0 \end{matrix} \quad \begin{matrix} m-7 \neq 0 \\ m \neq 7 \end{matrix}$$

$$2) \frac{m^2+m-12}{m^2-m-6} = \frac{(m+4)(\cancel{m-3})}{(\cancel{m-3})(m+2)} = \boxed{\frac{m+4}{m+2}} \quad \begin{matrix} (m-3)(m+2) \neq 0 \\ m \neq 3 \quad m \neq -2 \end{matrix}$$

$$3) \frac{x^2-5x+4}{3-3x} \cdot \frac{2x^2+12x}{2x^2-8x} = \frac{(x-4)(\cancel{x-1})^{-1}}{3(1-\cancel{x})} \cdot \frac{2x(\cancel{x+6})}{2x(\cancel{x-4})} = \boxed{\frac{-(x+6)}{3}}$$

$$4) \frac{10r^3+10r^2}{r+1} \cdot \frac{3r^2-27r}{10r^3-90r^2} = \frac{\cancel{10r^2}(r+1)}{\cancel{10r^2}(r-9)} \cdot \frac{3r(\cancel{r-9})}{\cancel{10r^2}(r-9)} = \boxed{3r}$$

$$5) \frac{n^2-13n+40}{7n-35} \div \frac{n^2-16n+64}{n^2-64} = \frac{(n-8)(n-5)}{7(n-5)} \div \frac{(n-8)(n-8)}{(n-8)(n+8)}$$

$$= \frac{\cancel{(n-8)}(\cancel{n-5})}{7(\cancel{n-5})} \cdot \frac{(n-8)(n+8)}{(\cancel{n-8})(\cancel{n-8})} = \boxed{\frac{n+8}{7}}$$

$$6) \frac{-4ab}{21c} \div \frac{22a^2}{14c^2} = \frac{-\cancel{4}ab}{\cancel{2}1c} \cdot \frac{\cancel{14}c^2}{\cancel{22}a^2} = \frac{-2b \cdot 2c}{3 \cdot 11a} = \boxed{\frac{-4bc}{33a}}$$

$$7) \frac{3-v}{v-8} \div \frac{v-3}{v^2-16v+64} = \frac{3-v}{v-8} \div \frac{v-3}{(v-8)(v-8)} = \frac{\cancel{3-v}}{\cancel{v-8}} \cdot \frac{(v-8)(v-8)}{\cancel{v-8}}$$

$$= \boxed{-(v-8)} \text{ or } \boxed{-v+8}$$

$$8) \frac{3}{x+1} \div \frac{5}{x-1} = \frac{3}{x+1} \cdot \frac{x-1}{5} = \boxed{\frac{3(x-1)}{5(x+1)}}$$

$$9) \frac{5}{3y} + \frac{6}{2xy^2} = \frac{5 \cdot 2xy}{6xy^2} + \frac{6 \cdot 3}{6xy^2} = \frac{10xy+18}{6xy^2} = \boxed{\frac{5xy+9}{3xy^2}}$$

$$\hookrightarrow \frac{2(5xy+9)}{3xy^2}$$

$$10) \frac{2}{x-5} - \frac{6}{x+6} = \frac{2(x+6)}{(x-5)(x+6)} - \frac{6(x-5)}{(x-5)(x+6)}$$

$$= \frac{2x+12-6x+30}{(x-5)(x+6)} = \frac{-4x+42}{(x-5)(x+6)} = \boxed{\frac{-2(2x-21)}{(x-5)(x+6)}}$$

$$11) \frac{8}{m^2-25} + \frac{9}{m-5} = \frac{8}{(m+5)(m-5)} + \frac{9(m+5)}{(m+5)(m-5)}$$

$$= \frac{8+9m+45}{(m+5)(m-5)} = \boxed{\frac{9m+53}{(m+5)(m-5)}}$$

$$12) \left(2 + \frac{1}{x}\right) \div \left(5 - \frac{1}{x}\right) = \left(\frac{2x}{x} + \frac{1}{x}\right) \div \left(\frac{5x}{x} - \frac{1}{x}\right)$$

$$= \left(\frac{2x+1}{x}\right) \div \left(\frac{5x-1}{x}\right) = \frac{2x+1}{x} \cdot \frac{x}{5x-1} = \boxed{\frac{2x+1}{5x-1}}$$

$$13) A = P \left(1 + \frac{r}{n}\right)^{nt} = 325 \left(1 + \frac{0.06}{4}\right)^{4(9)} = 555.4703$$

You will have \$555.47 after 9 years

$$14) A = 5000 \left(1 + \frac{0.04}{12}\right)^{12(15)}$$

$$= 9101.5081$$

$$A = 5000 \left(1 + \frac{0.035}{365}\right)^{365(15)}$$

$$= 8452.0815$$

The first option at 4% is better because it will earn \$649.43 more over 15 years.

$$15) \log_6 36 = x = \boxed{2}$$

$$6^x = 36$$

$$6^2 = 36$$

$$17) \log_4 32 = x = \boxed{5/2}$$

$$4^x = 32$$

$$(2^2)^x = 2^5$$

$$2^{2x} = 2^5$$

$$16) \log_3 1 = x = \boxed{0}$$

$$3^x = 1$$

$$3^0 = 1$$

$$2x = 5$$

$$x = 5/2$$



$$(18) \log_9 81 = 2 \quad \boxed{9^2 = 81}$$

$$(19) 7^3 = 343 \quad \boxed{\log_7 343 = 3}$$

$$(20) \log_4 15 + \log_4 y^5$$

$$\boxed{\log_4 15 + 5 \log_4 y}$$

$$(21) \log_6 \frac{7}{y^3} = \log_6 7 - \log_6 y^3$$

$$= \boxed{\log_6 7 - 3 \log_6 y}$$

$$(22) \log_5 9 y^3 \sqrt{x} = \log_5 9 + \log_5 y^3 + \log_5 x^{\frac{1}{2}}$$

$$= \boxed{\log_5 9 + 3 \log_5 y + \frac{1}{2} \log_5 x}$$

$$(23) \log_6 12 - \log_6 y = \boxed{\log_6 \frac{12}{y}}$$

$$(24) \log_7 4x + \log_7 3y = \log_7 (4x)^3 + \log_7 3y = \log_7 64x^3 \cdot 3y$$

$$= \boxed{\log_7 192x^3y}$$

$$(25) \log x - \log z^2 + \log y = \log x^{\frac{1}{2}} - \log z^2 + \log y = \log \frac{\sqrt{x}}{z^2} + \log y$$

$$= \boxed{\log \frac{y\sqrt{x}}{z^2}}$$

$$(26) \begin{aligned} 81^{-n-3} &< 3^{2n+5} \\ (3^4)^{-n-3} &< 3^{2n+5} \\ 3^{-4n-12} &< 3^{2n+5} \\ -4n-12 &< 2n+5 \end{aligned}$$

$$\begin{aligned} -17 &< 6n \\ -17/6 < n &\quad \text{or } n > -17/6 \end{aligned}$$

$$(27) \begin{aligned} 16^{-x} &= \left(\frac{1}{64}\right)^{x+1} \\ (4^2)^{-x} &= \left(\frac{1}{4^3}\right)^{x+1} \\ 4^{-2x} &= (4^{-3})^{x+1} \\ 4^{-2x} &= 4^{-3x-3} \end{aligned}$$

$$\begin{aligned} -2x &= -3x-3 \\ \boxed{x &= -3} \end{aligned}$$

$$(28) \quad 36^{5-2x} > \frac{1}{216}$$

$$(6^2)^{5-2x} > \frac{1}{6^3}$$

$$6^{10-4x} > 6^{-3}$$

$$10-4x > -3$$

$$-4x > -13$$

$$\boxed{x < \frac{13}{4}}$$

$$(29) \quad \log_3(y-10) = 5$$

$$3^5 = y-10$$

$$243 = y-10$$

$$\boxed{253 = y} \quad \underline{\text{check!}}$$

$$(30) \quad \log_8(2x+4) = \log_8(x^2-11)$$

$$2x+4 = x^2-11$$

$$0 = x^2 - 2x - 15$$

$$0 = (x-5)(x+3)$$

$$x-5=0 \quad \text{or} \quad x+3=0$$

check!

$$\boxed{x=5}$$

$$x \neq -3$$

$$(32) \quad \log_{16} x = \frac{5}{4}$$

$$16^{\frac{5}{4}} = x$$

$$\sqrt[4]{16^5} = x$$

$$2^5 = x$$

$$\boxed{32 = x} \quad \underline{\underline{\text{check!}}}$$

$$(33) \quad \log_x 27 = \frac{3}{2}$$

$$x^{\frac{3}{2}} = 27$$

$$\sqrt{x^3} = 27$$

$$x^3 = 729$$

$$\boxed{x=9} \quad \underline{\underline{\text{check!}}}$$

$$(34) \quad \log_6 x = 7$$

$$6^7 = x$$

$$\boxed{279,936 = x} \quad \underline{\underline{\text{check!}}}$$

$$(35) \quad \log_2 32 = x+3$$

$$5 = x+3$$

$$\boxed{2 = x}$$

$$(31) \quad \log_3(5x+1) = \log_3(3x+7)$$

$$5x+1 = 3x+7$$

$$2x = 6$$

$$\boxed{x=3} \quad \underline{\underline{\text{check!}}}$$

$$(36) \quad \log_5(x-3) - \log_5 8 = 2$$

$$\log_5 \frac{x-3}{8} = 2$$

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

$$8 \cdot 25 = \frac{x-3}{8} \cdot 8$$

$$200 = x-3$$

$$\boxed{203 = x}$$

check!

$$(37) \log_3 x + \log_3 3x = 5$$

$$\log_3 3x^2 = 5$$

$$3^5 = 3x^2$$

$$243 = 3x^2$$

$$81 = x^2$$

$$\pm 9 = x \quad \text{check}$$

$$\boxed{x=9}$$

$$(38) A = P(1+r)^n$$

$$A = 10,000(1+.04)^5$$

$$A = \$12,166.53 \quad \boxed{G}$$

$$(39) \log_2 8 = x$$

$$2^x = 8$$

$$2^x = 2^3$$

$$\boxed{x=3}$$

$$\boxed{A}$$

$$(40) 3^x = 54 \quad 3^2 = 9$$

$$3^3 = 27$$

$$3^4 = 81$$

$$3 < x < 4 \quad \boxed{C}$$

$$(41) \log_2 24 - \log_2 3 = \log_5 x$$

$$\log_2 \frac{24}{3} = \log_5 x$$

$$\log_2 8 = \log_5 x$$

$$3 = \log_5 x$$

$$5^3 = x$$

$$x = 125$$

$$\boxed{J}$$