Whiteboard Review

(1)

	$f(x)$	$g(x)$
a)	Domain: all real numbers	Domain: all real numbers
b)	Range: $y > 0$	Range: $y > 4$

(2)

$f(x)$	$g(x)$
Asymptote: $y = 0$	Asymptote: $y = 4$

(3) $f(x)$ is the parent

$g(x)$ is translated left 2 and up 4 from parent $f(x)$

(4)

$$\sqrt[4]{128x^7y^7}$$

$$\sqrt[4]{8 \cdot 16\, x^4 x^3 y^4 y^3}$$

$$\sqrt[4]{2^3 \cdot 2^4\, x^4 x^3 y^4 y^3}$$

$$\sqrt[4]{2^4 x^4 y^4} \cdot \sqrt[4]{2^3 x^3 y^3}$$

$$\boxed{2xy\sqrt[4]{8x^3y^3}}$$

(5)

$$\sqrt[3]{-16a^3b^8}$$

$$\sqrt[3]{-8 \cdot 2\, a^3 \cdot b^6 b^2}$$

$$\sqrt[3]{(-2)^3 \cdot 2\, a^3 \cdot b^6 \cdot b^2}$$

$$\sqrt[3]{(-2)^3 a^3 b^6} \cdot \sqrt[3]{2b^2}$$

$$\boxed{-2ab^2\sqrt[3]{2b^2}}$$

(6) Solve

$$3646 = 1 + 5(4r+17)^{3/2}$$

$$-1 \quad -1$$

$$\frac{3645}{5} = \frac{5(4r+17)^{3/2}}{5}$$

$$(729)^{2/3} = \left((4r+17)^{3/2}\right)^{2/3}$$

$$81 = 4r + 17$$

$$-17 \quad -17$$

$$\frac{64}{4} = \frac{4r}{4} \qquad \boxed{r = 16}$$

(7) Solve $\left((n-27)^{3/2}\right)^{2/3} = (64)^{2/3}$

$$n - 27 = 16$$

$$+27 \quad +27$$

$$\boxed{n = 43}$$

Whiteboard Review (continued)

(8) $p = 6191(1.04)^x$ what is % of increase?

$b = 1.04$

$b = 1 + r$ ← because increase, need plus

$1.04 = 1 + r$

$-1 \quad -1$

$.04 = r$

$\boxed{r = 4\%}$

(9) $26 = -1 + (27x)^{3/4}$

$+1 \quad +1$

$(27)^{4/3} = \left((27x)^{3/4}\right)^{4/3}$

$\frac{81}{27} = \frac{27x}{27}$

$\boxed{3 = x}$

(10) $\sqrt{2v-7} = v-3$ Solve

$\left(\sqrt{2v-7}\right)^2 = (v-3)^2$

$(v-3)(v-3)$

$2v-7 = v^2-6v+9$

$-2v \quad +7 \qquad -2v \quad +7$

$0 = v^2-8v+16$

$0 = (v-4)(v-4)$

$\boxed{v = 4}$

check $\sqrt{2(4)-7} = 4-3$

$\sqrt{1} = 1$ ✓

(11) $(81m^6)^{1/2}$ Simplify

$(81)^{1/2}(m^6)^{1/2}$

$\sqrt{81} \quad m^{6 \cdot 1/2}$

$9 \quad m^{6/2}$

$\boxed{9m^3}$

(12) Solve $3 = \sqrt{b-1}$

$3^2 = \left(\sqrt{b-1}\right)^2$

$9 = b-1$

$+1 \quad +1$

$\boxed{10 = b}$

check $3 = \sqrt{10-1}$ ✓

(13) initial car value = 25,000

5 yrs later value = 22,000

(0, 25000) (5, 22000)

$x \quad y \qquad x_1 \quad y_1$

$y = y_1 \cdot b^{x-x_1}$

$25000 = 22000 \cdot b^{0-5}$

$\frac{25000}{22000} = \frac{22000 \cdot b^{-5}}{22000}$

$\left(\frac{25}{22}\right)^{-1/5} = \left(b^{-5}\right)^{-1/5}$

$.9748 = b$

$\boxed{r = 2.5\%}$

subtract because decrease

$b = 1 - r$

$.9748 = 1 - r$

$-1 \quad -1$

$-.0252 = -r$

Whiteboard Review (continued)

(14) $x^{1/2} \cdot x^{1/5}$

$1/2 + 1/5$

$5/10 + 2/10$

$x^{7/10}$

(15) $3\sqrt{3y^3} - y\sqrt{27y}$

$3\sqrt{3y^2 \cdot y} - y\sqrt{9}\sqrt{3y}$

$3\sqrt{y^2}\sqrt{3y} - y \cdot 3\sqrt{3y}$

$3y\sqrt{3y} - 3y\sqrt{3y} = 0\sqrt{3y} = 0$

(16) $\log(x+8)+5 = g(x)$

$g(x)$ is translated left 8, up 5 from $f(x) = \log x$

(17) $\sqrt[5]{576y^5x^{12}}$

$\sqrt[5]{32 \cdot 18 y^5 x^{10} x^2}$

$\sqrt[5]{32y^5x^{10}} \cdot \sqrt[5]{18x^2}$

$2x^2y\sqrt[5]{18x^2}$

(18) $\sqrt{-10+7p} = p$ Solve

$\left(\sqrt{-10+7p}\right)^2 = p^2$

$-10+7p = p^2$

$+10 \quad -7p \quad +10 - 7p$

$0 = p^2 - 7p + 10$

$0 = (p-5)(p-2)$

$p = 5, 2$

check $\sqrt{-10+7(5)} = 5$ ✓

$\sqrt{-10+7(2)} = 2$ ✓

(19) Magnesium 27 has ½ life of 9 yrs

Initial 50 g = a

$y = 50\left(\frac{1}{2}\right)^{x/9}$

$\frac{x}{9}$ figures out the # of times the half life occurred over x years

Whiteboard Review

(20) $\left(\frac{\sqrt[3]{a^2}}{\sqrt{b}}\right)^{-6} = \left(\frac{a^{2/3}}{b^{1/2}}\right)^{-6}$

$\frac{a^{2/3 \cdot -6}}{b^{1/2 \cdot -6}} = \frac{a^{\frac{-12}{3}}}{b^{-6/2}} = \frac{a^{-4}}{b^{-3}} = \boxed{\frac{b^3}{a^4}}$

(21) $\frac{5 \cdot 6^{3m}}{5} = \frac{20}{5}$ Solve

$6^{3m} = 4$

$\log 6^{3m} = \log 4$

$\frac{3m \log 6}{3 \log 6} = \frac{\log 4}{3 \log 6}$

$\boxed{m = 0.2579}$

(22) $5(10)^{x+7} + 6 = 66$ Solve

$-6 \quad -6$

$\frac{5(10)^{x+7}}{5} = \frac{60}{5}$

$10^{x+7} = 12$

$\log 10^{x+7} = \log 12$

$(x+7)\frac{\log 10}{\log 10} = \frac{\log 12}{\log 10}$

$x + 7 = \frac{\log 12}{\log 10} - 7$

$-7 \quad -7$

$x = \frac{\log 12}{\log 10} - 7$

$\boxed{x = -5.9208}$

(23) $(4, 252.2) \quad (12, 203.88)$

$x \quad y \quad x_1 \quad y_1$

$y = y_1 \cdot b^{x - x_1}$

$\frac{252.2}{203.88} = \frac{203.88 \cdot b^{4-12}}{203.88}$

$(1.2370)^{-1/8} = (b^{-8})^{-1/8}$

$.9738 = b$

$y = y_1 \cdot b^{x - x_1}$ ← put $x = 0$ to find initial value

$y = 203.88(.9738)^{0-12}$

$y = 280.50 = \text{initial value} = a$

$\boxed{y = 280.50(.9738)^x}$

(24) $y = 4x + 5$ Find Inverse

$x = 4y + 5$

$-5 \quad -5$

$\frac{x-5}{4} = \frac{4y}{4}$

$\boxed{y = \frac{x-5}{4} \text{ or } \frac{1}{4}(x-5) = y}$

(25) $y = 3x^5 + 7$ Find inverse

$x = 3y^5 + 7$

$-7 \quad -7$

$\frac{x-7}{3} = \frac{3y^5}{3}$

$\sqrt[5]{\frac{x-7}{3}} = \sqrt[5]{y^5}$

$\boxed{y = \sqrt[5]{\frac{x-7}{3}} \text{ or } y = \left(\frac{x-7}{3}\right)^{1/5}}$

Whiteboard Review (continued)

(26) $6^x = 1296$

convert to logarithmic form → do log loop !! ☺

$\log_6 1296 = x$

check $\log_6 1296 = x$ ✓

$6^x = 1296$

(27) $7^x = 343$

convert to logarithmic form → Do log loop !! ☺

$\log_7 343 = x$

check $\log_7 343 = x$ ✓

$7^x = 343$

(28) Find exponential model from table

↳ enter data in L1 and L2

then do ExpReg L1, L2, Y1

$y = 30.86(0.8319)^x$