0. $\sqrt[3]{8} (2)^3 = 8 \sqrt[3]{8}$

4. $f(x) = \frac{1}{6} \left( \frac{\sqrt[5]{x+4}}{x} \right)^5 + \frac{5}{3}$

5. $g(t) = \sqrt[5]{6(t^5 + 2)} - 4$

6. $h(x) = \sqrt[3]{x^3 + 4} - 4$

2. $8 \sqrt[3]{10 - 3x} = \sqrt[2]{2 - x}$

3. \[
\begin{align*}
(2 \sqrt{10 - 3x}) &= \sqrt{2 - x} \\
8 \cdot (10 - 3x) &= 2 - x \\
80 - 24x &= 2 - x \\
6x &= 78 \\
x &= \frac{78}{6} = 13
\end{align*}
\]

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80 - 24x &= 2 - x \\
6x &= 78 \\
x &= \frac{78}{6} = 13
\end{align*}
\]

5. $\delta = 36$
6. \[
25 = 3 \cdot \frac{3}{4} \sqrt{3 - 10} + 11 - 1
\]
\[
13.9 = 3 \cdot 17\sqrt{3 - 10}
\]
\[
\left(\frac{13.9}{3.1}\right)^3 = \left(\sqrt[3]{3 - 10}\right)^3
\]
\[
(13.9)^3 = 3 - 10
\]
\[
f = \left(\frac{13.9}{3.1}\right)^3 = -10
\]
\[F = 80.15 \text{ N.m.}\]

7. a) \( f(x) = \sqrt{x} + 4 \) \( \forall x \geq 0 \)
   
   b) \( \sqrt{x} - 2 = 0 \) \( \forall x \geq 0 \)

8. a) b/c it is a transformation that reflects over the x-axis, it cannot be considered growth. *(neither)*
   
   b) b/c \( 5/4 \) is > 1 and exponent is positive, this is growth*
   
   c) b/c the exponent is neg. with a base > 1, this is decay

9. \[
A(25) = 9000 \left(1 + \frac{.05}{4}\right)^{25}
\]
   \[
\approx 304,771.94
\]

10. \[
8000 = 22,000 (1.115)^t
\]
    \[
\frac{8000}{22,000} = 0.3636
\]
    \[
\ln\left(\frac{y}{t}\right) = \ln(0.875)
\]
    \[
\ln\left(\frac{y}{1000}\right) = t \ln(0.875)
\]
    \[
\ln(0.875)
\]
    \[
t = 7.58 \text{ yrs}
\]

11. \[
P(6) = 800 e^{.05 \cdot 6}
\]
    \[
\approx 1112.77
\]

12. \[
P(3) = 4000 \left(1 + \frac{.05}{4}\right)^{4 \cdot 3}
\]
    \[
\approx 424.67
\]
(a) \[
\begin{array}{c|c|c|c}
\{x, y\} & \sqrt{y} & x & y \\
\hline
(-1, 0) & 1 \sqrt{3} & 0 & 1 \sqrt{2}
\end{array}
\]

(b) \[
\begin{array}{c|c|c|c}
\{x, y\} & x & y & y \\
\hline
(-1, 0) & 1 \sqrt{2} & 2 \sqrt{2} & 2
\end{array}
\]

(c) \[
\begin{array}{c|c|c|c}
\{x, y\} & x & y & y \\
\hline
(-1, 0) & 1 \sqrt{2} & 2 \sqrt{2} & 2
\end{array}
\]

(d) \[
\begin{array}{c|c|c|c}
\{x, y\} & x & y & y \\
\hline
(-1, 0) & 1 \sqrt{2} & 2 \sqrt{2} & 2
\end{array}
\]

\[\log_2 (5 \cdot 10) = \log_2 5 + \log_2 10 = 2.322 + 3.322 \approx 5.6441\]

\[\log_4 \frac{\sqrt{2}}{\sqrt{3}} = \log_4 \left(\frac{2}{3}\right)^{1/2} = \log_4 \frac{1}{3} = \log_4 3^{-1}
\]

\[\ln 2 + \ln y + \ln x = \ln 2 + 2 \ln y + \ln x \]

\[\frac{\log 15}{10} \approx 1.392\]

\[y = 3.04 \cdot 1.19^x\]

\[\frac{t^2 + 4}{1 + 2te^{-t}} = 3.3 (1 + 2.5e^{-1.5})\]

\[y = 3.3 + 8.25e^{-x}\]

\[y = 8.25 \cdot 8.25\]

\[\ln 0.0818 = \ln e^{-0.4}\]

\[\ln 0.0818 = \ln e^{-0.4}\]

\[x = \ln 0.0818 - 0.4\]

\[\ln \left(\frac{1}{100}\right) = \ln 10^{-2}\]
21. a) \[
\log x = \frac{Y}{x} = \frac{-1}{1} = -1;
\]
   \[
[0, 10]; 10; 1; 10; 1; 10; 2
\]
   \[
D: (0, 10) \quad P: (10, 10)
\]
   VA: \[x = 0\]

b) \[
\ln x = \frac{Y}{x} = \frac{-1}{1} = -1;
\]
   \[
[2, 7]; 2; 7; 1
\]
   \[
D: (0, 10) \quad P: (10, 10)
\]
   VA: \[x = 0\]

22. \[
\text{Stat/EDIT enter points; } \ln L_1 \text{ and } L_2
\]
   \[
\text{STAT/CALC PolyReg Calculate; } Y = 1.30 + 0.121x
\]

23. \[
\text{Skip}
\]

24. \[
\text{Stat/EDIT enter points; } \ln L_1 \text{ and } L_2
\]
   \[
\text{STAT/CALC PolyReg Calculate; } Y = 1.30 + 0.121x
\]

25. \[
280 = 93 \log d + 65
\]
   \[
215 = 93 \log d
\]
   \[
\log d = \frac{215}{93}
\]
   \[
10^{215/93} = d \approx 205.03 \text{ mi}
\]

26. \[
9.5 = 0.291 \ln E + 1.17
\]
   \[
8.33 = 0.291 \ln E
\]
   \[
0.291 \cdot \frac{8.33}{0.291} = 28.63 = \ln E
\]
   \[
E = e^{28.63} = 2.72 \times 10^{12}
\]

27. \[
\text{Stat/EDIT enter points; } L_1 \text{ and } L_2
\]
   \[
\text{STAT/CALC ExpReg Calculate; } Y = 250.51 + 1.10x
\]

28. \[
Y = kx
\]
   \[
2 = \frac{k}{2}
\]
   \[
3 = \frac{k}{3}
\]
   \[
k = 6
\]
   \[
Y = kx
\]

29. \[
Z = k \cdot y
\]
   \[
\frac{5}{2} = \frac{k}{2} \cdot \frac{3}{4}
\]
   \[
k = 10
\]
   \[
Z = 10 \cdot (-2/4)
\]
   \[
Z = -5
\]

30. \[
a) V = k \cdot 21 \text{ h}
\]
   \[
b) 63.33 = k \cdot (2.92) \cdot 10.5
\]
   \[
63.33 = 60.425k
\]
   \[
60.425 \quad \text{and} \quad 63.33
\]
   \[
k \approx 1.05
\]

31. \[
15 = \frac{26.6d}{d + 0.0077}
\]

32. \[
26.6d = 15 (d + 0.0077)
\]
   \[
26.6d = 15d + 0.1005
\]
   \[
15d = 0.1005
\]
   \[
d = 0.0067
\]

33. \[
11.6d = 11.6d
\]
   \[
\Rightarrow d = 0.0220 \text{ m}
\]
35b \[ \frac{(x+2)(x-1)}{x+3} \cdot \frac{(x+5)(x+1)}{2(x-2)} \]
\[ = \frac{(x+2)(x+5)}{2} \]

35c \[ \frac{4(x-2)}{(x-3)(x+1)} \cdot \frac{x+1}{3x+2} \]
\[ = \frac{4}{3(x+2)} \]

36a \[ \frac{x+3}{x} \]
\[ = \frac{5}{6} \]
\[ 6(x+3) = 5x \]
\[ 6x + 18 = 5x \]
\[ x = -18 \]

b) \[ \frac{36}{2x} \]
\[ \text{LCM} = 2x \]
\[ \frac{1}{3} \cdot \frac{3}{2x} \cdot \frac{2x}{1} \]
\[ = \frac{72x}{2 + 7} = \frac{72x}{9} = 8x \]

37a \[ \frac{a}{x} + \frac{11}{5} = \frac{31}{x} \]
\[ \text{LCM} = 5x \]
\[ \frac{5a}{5} + \frac{11x}{5} \cdot \frac{5}{5} = \frac{31}{x} \cdot \frac{5}{5} \]
\[ 5a + 11x = 155 \]
\[ 11x = 155 - 5a \]
\[ x = 15 \]

b) \[ \frac{8}{x-3} \]
\[ \frac{5}{x+2} \]
\[ x + 2 \]
\[ 8(x+2) = 5(x+3) \]
\[ 8x + 16 = 5x + 15 \]
\[ 3x = 3 \]
\[ x = 1 \]

b) \[ \frac{8}{x-3} \]
\[ \frac{5}{x+2} \]
\[ x + 2 \]
\[ 8(x+2) = 5(x+3) \]
\[ 8x + 16 = 5x + 15 \]
\[ 3x = 3 \]
\[ x = 1 \]

37c \[ \frac{-15}{x} = \frac{x+10}{4} \]
\[ x(x + 10) = -60 \]
\[ x^2 + 10x = -60 \]
\[ x^2 + 10x + 60 = 0 \]
\[ (x + 10)(x + 6) = 0 \]
\[ x = -10 \]
\[ x = -6 \]

d) \[ \frac{3x}{2x-1} \]
\[ \frac{5}{4x} \]
\[ \frac{4x(2x-1)}{4x} \]
\[ \frac{3x}{2x-1} \]
\[ -2(4x)(2x-1) \]
\[ \frac{4x(2x-1) \cdot 3x}{1} \]
\[ \frac{4x(2x-1) \cdot 2x-1}{2x-1} \]
\[ 12x^2 - 16x^2 + 8x \]
\[ 10x^2 - 5x - 4x^2 \]
\[ -4x^2 + 8x \]
\[ -4x^2 + 10x - 5 \]
\[ \frac{4x(x-2)}{4x^2 + 10x - 5} \]
38. \( a_1 = 1(1) - 1 = 0 \)
   \( a_2 = 2(2) - 2 = 2 \)
   \( a_3 = 3(3) - 3 = 6 \)
   \( a_4 = 4(4) - 4 = 12 \)

39. \( a_n = -5 + (n-1)10 \)
   \( = -5 + 10n - 10 \)
   \( = 10n - 15 \)

40. \( 7, -1, 5, 11, 17, 23 \)
   \( \text{It is arithmetic. Common difference!} \)

41. \( a_n = 2 + (n-1)7 \)
   \( = 2 + 7n - 7 \)
   \( = 7n - 5 \)
   \( a_{10} = 67 \)

42. \( d = \frac{50 - 17}{14 - 3} = \frac{33}{11} = 3 \)
   \( a_n = a_1 + (n-1)d \)
   \( 17 = a_1 + (3-1)3 \)
   \( 17 = a_1 + 6 \)
   \( a_1 = 11 \)

43. \( a_n = a_1 + (n-1)3 \)
   \( = 11 + (n-1)3 \)
   \( = 11 + 3n - 3 \)
   \( = 3n + 8 \)

44. \( \frac{4}{3} = \frac{8 + 3}{3} = \frac{11}{3} \)
   \( \frac{24}{4} = 6 \)
   \( \frac{16}{2} = 8 \)
   \( \text{Yes, it is geometric. Common ratio!} \)

45. \( a_n = a_1 r^{n-1} \)
   \( a_n = 2 \cdot (-2)^{n-1} \)
   \( a_9 = 2 \cdot (-2)^8 \)
   \( = 2 \cdot (-64) \)
   \( = -128 \)

46. \( S_5 = 2 \left( \frac{1 - \frac{2^5}{3}}{1 - \frac{2}{3}} \right) \)
   \( a_1 = 3 \left( \frac{2}{3} \right) \)
   \( S_5 \approx 5.95 \)

47. \( 12, 13, 14, 15, 16, 17, 18 \)
   \( 2, 4, 8, 16, 32, 64 \)
   \( \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}, \frac{1}{64} \)

48. \( a_1 = -2 \)
   \( a_2 = 3(-2) - 6 \)
   \( a_3 = 3(-6) - 18 \)
   \( a_4 = 3(-18) - 54 \)
   \( a_5 = 3(-54) - 162 \)

49. \( \frac{12}{14} = \frac{9}{3} \)
   \( \frac{45}{59} = \frac{15}{19} \)
   \( a_n = 13n - 6 \)