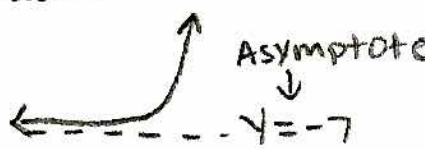
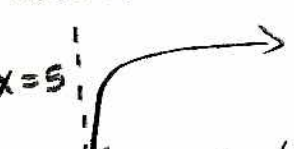


Lesson	Example Problems
<p>5.1 Intro to Exponential Functions</p>	<p>1. Find the transformations from the parent functions, domain, range, asymptote and end behavior for the following function.</p> <p>$f(x) = (2)^{x-3} - 7$</p> <p>rt 3) transform. down 7</p> <p>D: $(-\infty, \infty)$ R: $(-7, \infty)$</p> <p><u>end behavior</u></p> <p>$\lim_{x \rightarrow -\infty} f(x) = -7$ $\lim_{x \rightarrow \infty} f(x) = \infty$</p>  <p>2. Solve for x: $3^{2x+5} = 27^x$</p> <p>$3^{2x+5} = (3^3)^x$</p> <p>$2x + 5 = 3x$</p> <p>$5 = x$</p>
<p>5.2 Intro to Logarithmic Functions</p>	<p>3. Find the transformations from the parent functions, domain, range, asymptote and end behavior for the following function.</p> <p>$f(x) = \log(x-5) - 2$</p> <p>right 5) transform. down 2</p> <p>D: $(5, \infty)$ R: $(-\infty, \infty)$</p> <p><u>end behavior</u></p> <p>$\lim_{x \rightarrow 5} f(x) = -\infty$ $\lim_{x \rightarrow \infty} f(x) = \infty$</p> <p><u>Asymptote</u></p>  <p>4. Solve for x: $\log(x^2) = \log(7x-12)$</p> <p>$x^2 = 7x - 12$</p> <p>$x^2 - 7x + 12 = 0$</p> <p>$(x-3)(x-4) = 0$</p> <p>$x = 3$ $x = 4$</p>
<p>5.3 Converting between Exponential and Logarithmic Forms</p>	<p>Solve for x:</p> <p>5. $\log_x 32 = 5$</p> <p>$x^5 = 32$</p> <p>$x = 2$</p> <p>6. $\log_2 \left(1 + \frac{x}{2}\right) = 4$</p> <p>$2^4 = 1 + \frac{x}{2}$</p> <p>$16 = 1 + \frac{x}{2}$</p> <p>$2 \cdot 15 = \frac{x}{2} \cdot 2$</p> <p>$x = 30$</p>

<p>5.4 Properties of Logarithms</p>	<p>7. Simplify to a single answer (term): $\log_4(2) + \log_4(8) + 2$</p> $\log_4(16) + 2$ $2 + 2 = \boxed{4}$ <p>8. Given $\log_n b = 12$, $\log_n c = 3$ find $\log_n \left(\frac{c}{b^2}\right)$</p> $= \log_n c - \log_n b^2$ $= \log_n c - 2 \log_n b$ $3 - 2(12)$ $3 - 24 = \boxed{-21}$
<p>5.5 Solving Logarithmic Equations</p>	<p>Solve for x:</p> <p>9. $\log_6(x+2) = 1 + \log_6(x-3)$</p> $\log_6(x+2) - \log_6(x-3) = 1$ $\log_6\left(\frac{x+2}{x-3}\right) = 1$ $6^1 = \frac{x+2}{x-3}$ $6x - 18 = x + 2$ $5x = 20 \quad \boxed{x=4}$ <p>10. $\log_7(x-5) + \log_7(x+1) = 1$</p> $\log_7(x^2 - 4x - 5) = 1$ $7^1 = x^2 - 4x - 5$ $0 = x^2 - 4x - 12$ $0 = (x-6)(x+2)$ $\boxed{x=6} \quad \cancel{x=-2}$
<p>5.6 Solving Exponential Equations</p>	<p>Solve for x:</p> <p>11. $2.4^{3x+1} = 9$</p> $\log 2.4^{3x+1} = \log 9$ $(3x+1) \log 2.4 = \log 9$ $3x+1 = \frac{\log 9}{\log 2.4}$ $3x = \frac{\log 9}{\log 2.4} - 1$ $\boxed{x = \frac{\log 9}{3 \log 2.4} - \frac{1}{3}}$ <p>or</p> $\frac{1}{3} \left(\frac{\log 9}{\log 2.4} - 1 \right)$
<p>5.7 Natural Logarithms and Base e</p>	<p>Solve for x:</p> <p>12. $3 \ln x + 2 \ln 2 = \ln 64$</p> $\ln 4x^3 = \ln 64$ $4x^3 = 64$ $x^3 = 16$ $\boxed{x = \sqrt[3]{16}}$ <p>13. $e^{x-2} + 4 = 21$</p> $e^{x-2} = 17$ $\ln 17 = x - 2$ $\boxed{x = \ln(17) + 2}$ <p>14. $\ln 2 + \ln x = 3$</p> $\ln(2x) = 3$ $e^3 = 2x$ $\boxed{x = \frac{e^3}{2}}$