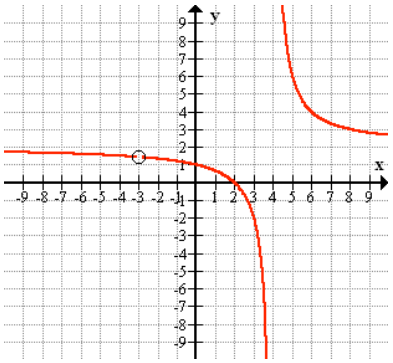
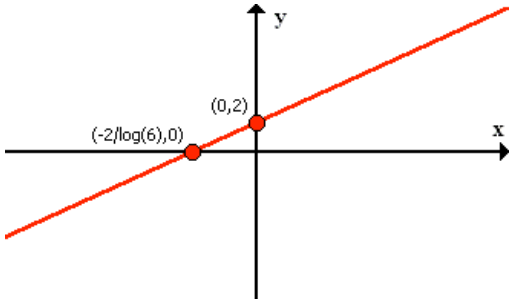
Midterm Exam Review ANSWER KEY

1. -6
2. 8 (x = -2 is extraneous)
3. $x=1, x=\log_3 2$
4. 11.2 years
5. $(-2,-5)$
6. $a=\frac{19}{81}$
7. $y=\left(\frac{1}{x}+1\right)^2$
8. a) -4 b) -5 c) -3 d) -15
9. $\sin^{-1}\left(\frac{2}{5}\right)$ has one unique answer because you are evaluating the <u>function</u> $\sin^{-1} x$ to find the one angle in the range of the sine inverse function such that the sine of the angle is $\frac{2}{5}$; the equation $\sin x=\frac{2}{5}$ has an infinite number of answers since you are being asked to find <u>all</u> angles such that the sine of the angle is $\frac{2}{5}$ and with the period of sine being 2π that leads to an infinite number of angles that have a y-coordinate on the unit circle of $\frac{2}{5}$.
10. 

11. $p+2q$
12. $y=-3(x+3)^2+9$
13. $\sin\theta=\frac{5}{\sqrt{32}}$
14. a = 15.5 or 6.76
15. 1120
16. a) The ratio of any two consecutive terms must be a constant.
    b) Show that $\frac{u_{n+1}}{u_n}$ will always be constant.

17. x-intercept $\left(\frac{-2}{\log 6},0\right)$ y-intercept $(0,2)$



18. $x=\dfrac{\log\left(\frac{7}{243}\right)}{\log\left(\frac{7}{9}\right)}$

19. a) Hint: let the quadratic function be $f(x)=ax^2+bx+c$ and the linear function be $g(x)=mx+d$ then show that $f(g(x))$ and $g(f(x))$ are both quadratic.

    b) Use your result from part a with m and a both being negative.

20. 264 (If you did this by finding all 6 values and adding them try to do it using formulas instead).