$m = \frac{y_2 - y_1}{x_2 - x_1}$, $y = m(x - x_1) + y_1$

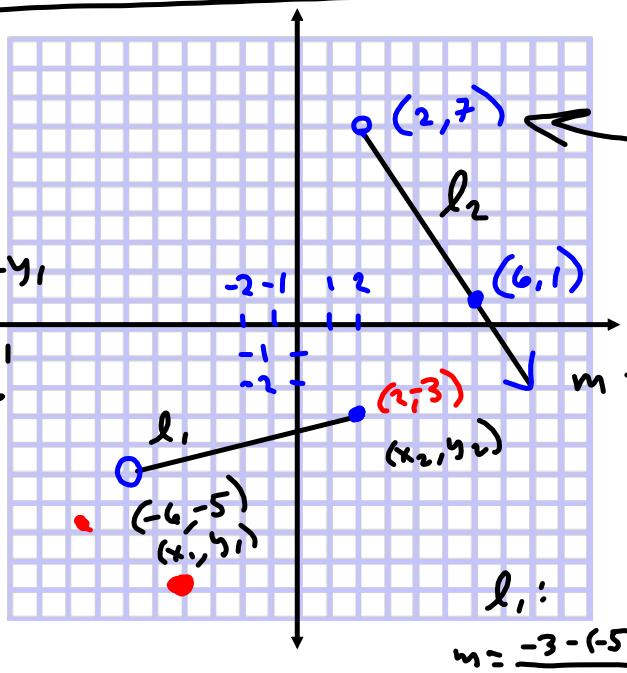
$y - y_1 = m(x - x_1)$

$\frac{y_2 - y_1}{x_2 - x_1} = m$

$y_2 - y_1 = m(x_2 - x_1)$

$y_2 = m(x_2 - x_1) + y_1$

$y = m(x - x_1) + y_1$



$m = \frac{y_2 - y_1}{x_2 - x_1} =$

Put a dot where I want the points.

l_1:

$m = \frac{-3 - (-5)}{2 - (-6)} = \frac{2}{8} = \frac{1}{4}$

$f(x) = \begin{cases} l_1 & \text{if } -6 < x \leq 2 \\ l_2 & \text{if } 2 < x < \infty \end{cases}$

l_2: $\frac{7 - 1}{2 - 6} = \frac{6}{-4} = -\frac{3}{2}$

$= \begin{cases} \frac{1}{4}(x - (-6)) - 5 \\ -\frac{3}{2}(x - 2) + 7 \end{cases}$

$y = m(x - x_1) + y_1$

Parallel: $m_2 = m_1$

Perpendic: $m_2 = -\frac{1}{m_1}$

$y = \frac{13}{7}x - 11$

$y = m(x - x_1) + y_1$

$-(-11)$

$\parallel$ thru $(-11, 25)$

$y = \frac{13}{7}(x+11) + 25$

$\perp$ .. $(-11, 25)$

$y = -\frac{7}{13}(x+11) + 25$

If you haven't graphed the 6 or 7 ~~2~~ funcs I put up the other day, then you need to.

$2 \cdot 3^{5x-10} - 4$

$2\sqrt{5x-10} - 4$

$5x-10$

$5(x-2)$

0. Basic
1. $2f(x)$ $2y$
2. $2f(5x)$ $\frac{1}{5}x$
3. $2f(5(x-2))$ $x+2$
4. $2f(5(x-2)) - 4$ $y-4$

The half-life of freakazoidium is 350 years.

$$A(t) = A_0 e^{kt}$$

$$A(350) = A_0 e^{350k} = \frac{1}{2} A_0$$

$$e^{350k} = \frac{1}{2}$$

$$\ln(e^{350k}) = \ln\left(\frac{1}{2}\right) = -\ln(2)$$

$$350k = -\ln(2)$$

$$k = \frac{-\ln(2)}{350}$$

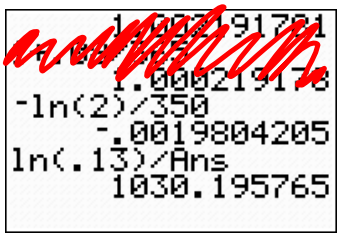
Follow-up:

$$A(t) = A_0 e^{\frac{-\ln(2)}{350}t} \approx A_0 e^{-.0019804205t}$$

Derive the model.

How old is a sample that has 13% of freakazoidium left?

$$A_0 e^{kt} = .13 A_0$$



$$e^{kt} = .13$$

$$\ln(e^{kt}) = \ln(.13) \quad *$$

$$kt = \ln(.13)$$

$$t = \frac{\ln(.13)}{k} = \frac{\ln(.13)}{\frac{-\ln(2)}{350}} = -\frac{350\ln(.13)}{\ln(2)}$$

$$\approx 1030.195765 \text{ yrs}$$

$$\approx 1030 \text{ yrs.}$$

Sketch

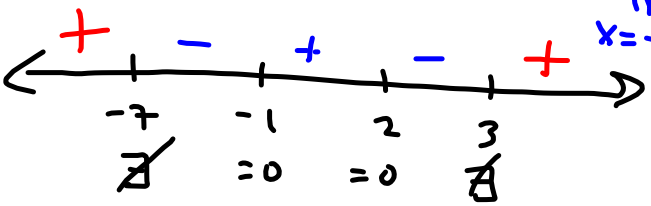
$$\frac{x^2-x-2}{x^2+4x-21} = \frac{(x-2)(x+1)}{(x-3)(x+7)}$$

$\mathcal{D}$: $\mathbb{R} \setminus \{-7, 3\}$

V.A.: $x=-7$, $x=3$

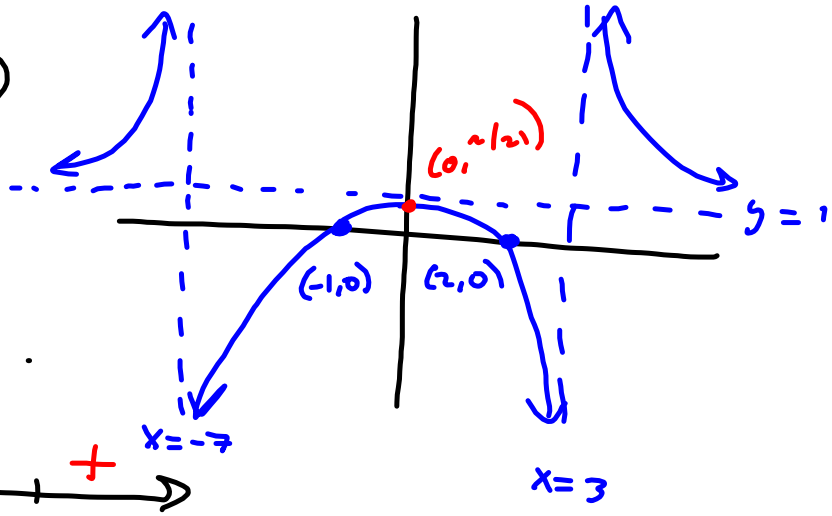
H.A: $y=1$

x-int: $(2,0)$, $(-1,0)$



y-int: $(0, \frac{2}{21})$

$\frac{x \cdot x}{x \cdot x} = 1 = y$



$m = \frac{y_2 - y_1}{x_2 - x_1}$; $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$y = m(x - x_1) + y_1$

$A(t) = A_0 e^{kt}$; $A(t) = A_0\left(1 + \frac{r}{m}\right)^{mt}$

$\sum_{k=1}^{n} ar^{k-1} = \frac{a(1-r^n)}{1-r}$

~~$|A| > B$~~ ~~$A > B$ OR $A < -B$~~ ~~$|A| < B$ $A < B$ AND $A > -B$~~

Chapter 3 — Find zeros, real & nonreal

→ Doubles in 5 years, compounded continuously
Find growth rate.

→ $(x+1)(x-2)(x-(3+2i))(x-(3-2i))$

x^4-7x^3+17x^2-x-26 Expanded

$x^4 - 7x^3 + 17x^2 - x - 26$

$\pm 1, \pm 2, \pm 13, \pm 26$

x+1

−1	1	−7	17	−1	−26
		−1	8	−25	26
2	1	−8	25	−26	0
		2	−12	26	
	1	−6	13	0	

Sweet! Nice!

$(x+1)(x-2)(x^2 - 6x + 13)$

52
26
16

$b^2 - 4ac = (-6)^2 - 4(1)(13) = 36 - 52 = -16$

$x = \frac{6 \pm \sqrt{-16}}{2(1)} = \frac{6 \pm 4i}{2} = 3 \pm 2i$

$(x+1)(x-2)(x-(3+2i))(x-(3-2i))$