Ds 4 Key

①

$$\begin{array}{r} x - 1 \\ x - 1 \overline{) x^2 - 2x - 15} \\ -x^2 + x \quad\quad \\ \hline -x - 15 \\ +x - 1 \\ \hline -16 \end{array}$$

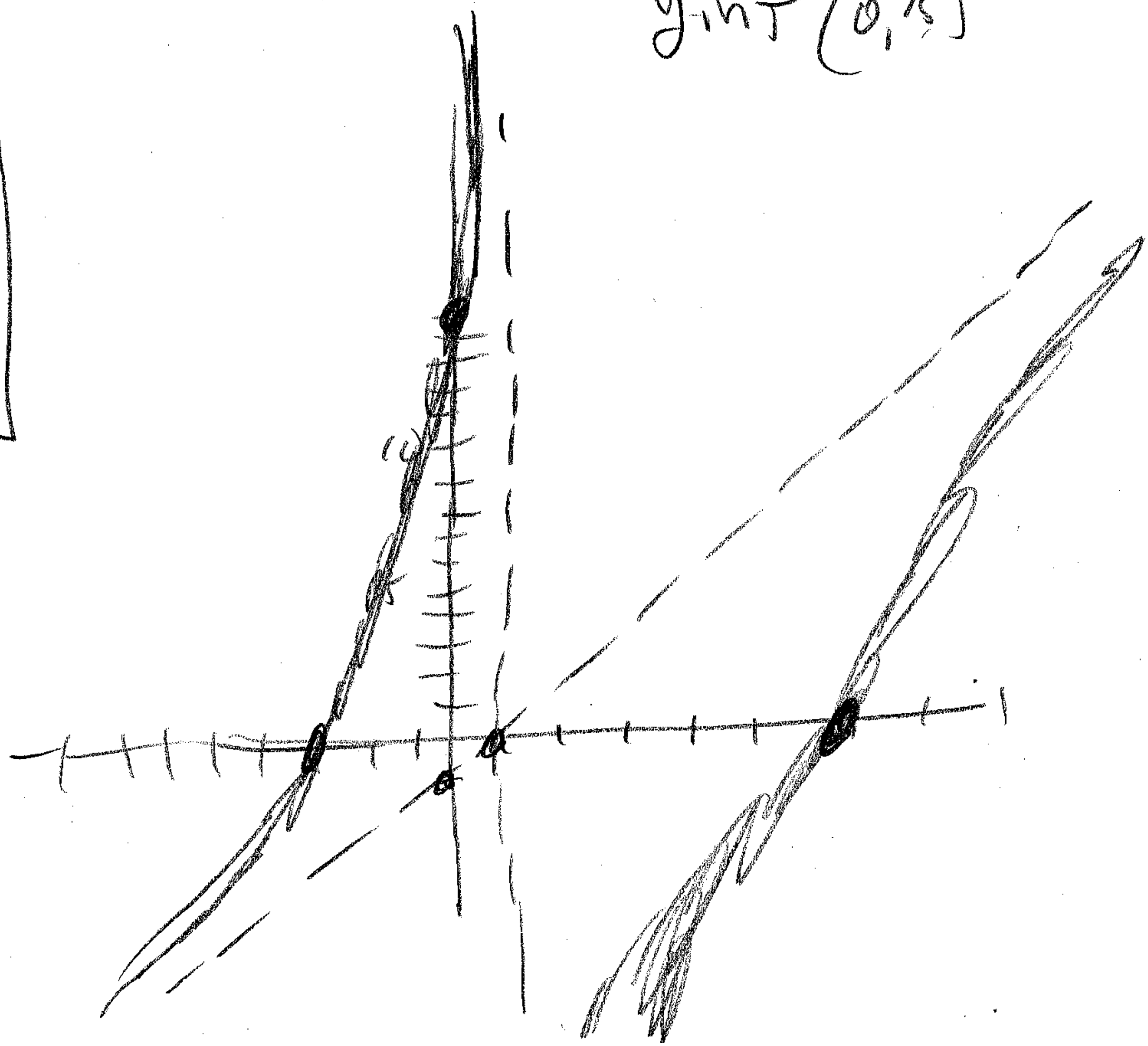
S.A = $x - 1$

$$\frac{(x-5)(x+3)}{x-1}$$

VA $x = 1$

zeros $(5, 0)$ $(-3, 0)$

y-int $(0, 15)$



(4)

+6	1	-8	17	-30
		+6	-12	30
	1	-2	5	0

$(x-6)(x^2-2x+5)$

other zeros

$x^2-2x+5=0$

$x=\frac{2\pm\sqrt{4-4(1)(5)}}{2(1)}$

$\frac{2\pm\sqrt{-24}}{2}$

$\frac{2\pm 2\sqrt{6}}{2}$

$1\pm\sqrt{6}$

$x=6$

$x=1-\sqrt{6}$

$x=1+\sqrt{6}$

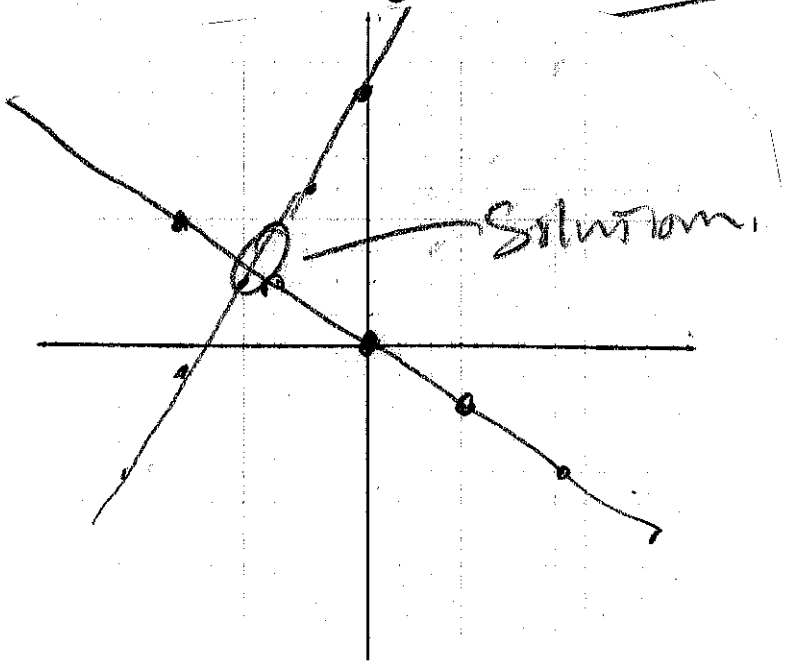
(5) $2x+3y=7$

$3x-2y=-16$

$y=-\frac{2}{3}x$

$-2y=-3x-16$

$y=\frac{3}{2}x+8$



(1) $(-5,-8)(-1,-1)$ $m = \frac{-1+8}{-1+5} = \frac{7}{4}$

$y+8 = \frac{7}{4}(x+5)$

or

$y+1 = \frac{7}{4}(x+1)$

(2) $2|x-5|-3 \geq 7$

$2|x-5| \geq 10$

$|x-5| \geq 5$

$x-5 \leq -5$ $x-5 \geq 5$

$x \leq 0$ $x \geq 10$

$(-\infty, 0] \cup [10, \infty)$

(c) (0, 85,000) (12, 42000)

Periodic model is probably better "each year"

$42000 = 85000b^{12}$

$0.4941 = b^{12} \rightarrow \sqrt[12]{0.4941}$ $b \approx 0.9429$

$y = 85000(0.9429)^x$

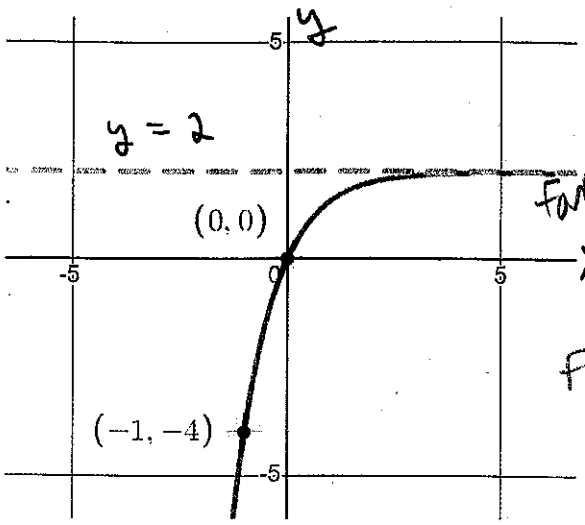
2030 = 17 yrs $85000(.9429)^{17}$

$\approx$ 31,310

You may complete your work on these sheets for these graphs

For each graph, write an appropriate function:

7.



Exponential

$y = ab^x + 2$

for (0,0) $0 = ab^0 + 2$

$-2 = a$

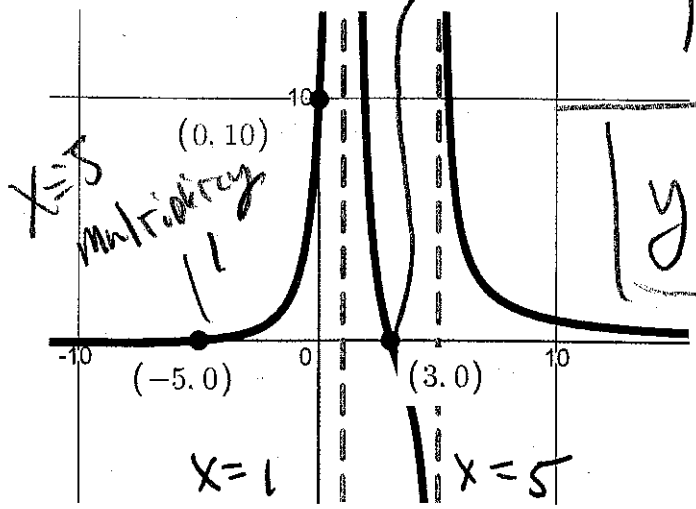
for (−1,−4) $-4 = -2b^{-1} + 2$

$-6 = \frac{-2}{b}$

$-6b = -2 \quad b = \frac{1}{3}$

$y = -2\left(\frac{1}{3}\right)^x + 2$

8.



X=3 multiplicity 1

X=5 multiplicity 1

VA's acts like $\frac{1}{x^2}$

$y = \frac{10(x+5)(x-3)}{3(x-1)^2(x-5)}$

if y-int = 0,10 must be a stretch factor

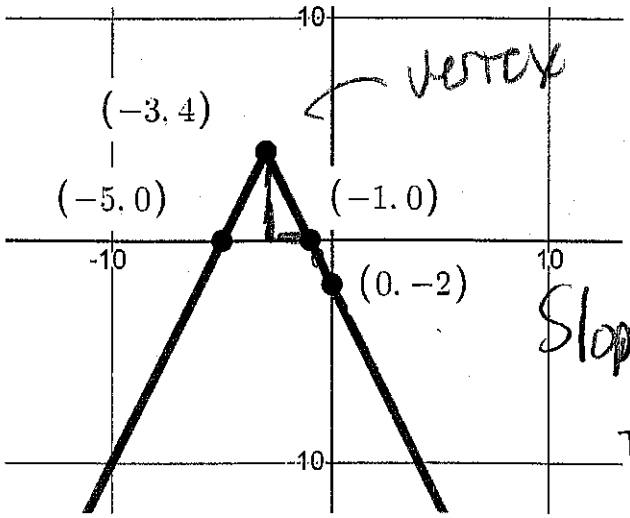
$10 = \frac{a(0+5)(0-3)}{(0-1)^2(0-5)}$

$10 = \frac{a(-15)}{-5} \rightarrow 10 = 3a$

$\frac{10}{3} = a$

You may complete your work on these sheets for these graphs

09.



Abs value

$y = a|x+3|+4$

Slope $= -\frac{4}{2} = -2$

$y = -2|x+3|+4$

or this way

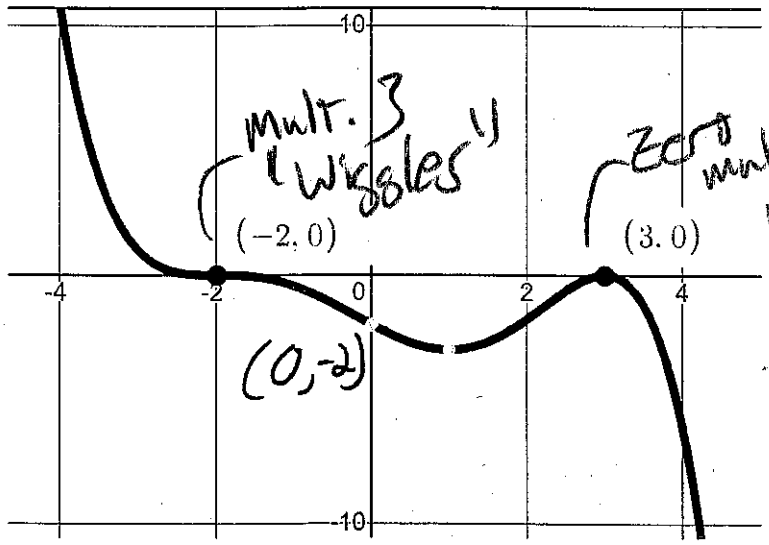
Passes Thru $(-1, 0)$

$0 = a|-1+3|+4$

$-4 = a(2)$

$-2 = a$

10.



Polynomial

$y = a(x+2)^3(x-3)^2$

Passes Thru $(0, -2)$

$-2 = a(0+2)^3(0-3)^2$

$-2 = a(8)(9)$

$\frac{-2}{72} = a$ or $-\frac{1}{36}$

$y = -\frac{1}{36}(x+2)^3(x-3)^2$