$$\begin{array}{r|rrr} -4 & 1 & -1 & -6 \\ & \downarrow & -4 & 20 \\ \hline & 1 & -5 & 14 \end{array}$$

O.A. = $y = x - 5$

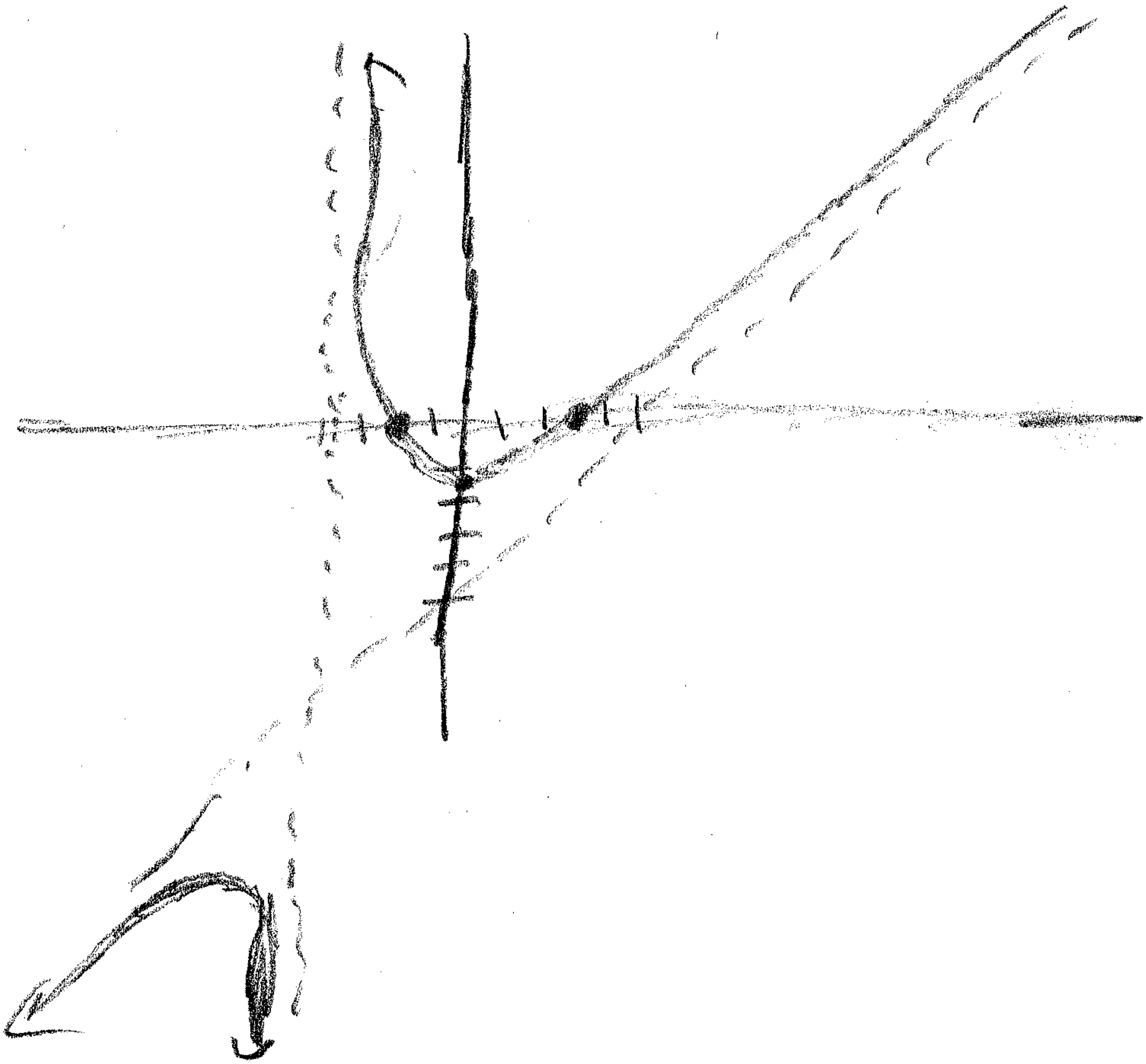
VA = $x = -4$

$x^2 - x - 6$

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

$(3,0)$ $(-2,0)$

y int = $(0, -\frac{3}{2})$



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(2) $f(x) = x^3 - 7x^2 + 9x + 5$

$+5 \mid 1 \quad -7 \quad 9 \quad 5$

$\quad\quad\quad 5 \quad -10 \quad -5$

$\quad 1 \quad -2 \quad -1 \quad 0$

$(x-5)(x^2-2x-1)$

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

$\dfrac{2 \pm \sqrt{8}}{2}$

$\dfrac{2 \pm 2\sqrt{2}}{2}$ $\quad 1 \pm \sqrt{2}$

$x = 5$

$x = 1 - \sqrt{2}$

$x = 1 + \sqrt{2}$

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(3) $B = 5000\left(1 + \dfrac{.18}{4}\right)^{4T}$ $\quad B = P\left(1 + \dfrac{r}{n}\right)^{nt}$

$B = 5000\,(1.045)^{4T}$

$50000 = 5000\,(1.045)^{4T}$

$10 = 1.045^{4T}$

$\log_{1.045}(10) = 4T$

$\dfrac{\log 10}{\log 1.045} = 4T$

$59.34 = 4T$

$13.\overline{3} \approx T$

(B) $y = ae^{kT}$

$y = 100e^{kT}$

$y = 100b^T$

(A) $y = 100(.951)^T$

$b = 1 + r$

(A) $y = 100e^{-.05T}$

$b = e^{-.05}$

$b = .951$

$.951 = 1 + r$

$-.049 = r$

(B) 4.9% decay rate.

(C) $y = 100e^{-.05(150)}$ $.0553$

$y = ab^x + c$

$y = 45b^x + 4$

$20 = 45b^{-52} + 4$

$16 = 45b^{-52}$

$\frac{.355}{1} = b^{-52}$

$\frac{.355}{1} = \frac{1}{b^{52}}$

$.355b^{52} = 1$

$b^{52} = \frac{1}{.355}$

$b = 1.02$

$y = ab^x + 4$

$49 = ab^0 + 4$

$49 = a + 4$

$45 = a$

$y = 45(1.02)^x + 4$

(6) $\ln(5x-4) = \ln 4 - \ln(x-1)$

$\ln(5x-4) + \ln(x-1) = \ln 4$

$\ln(5x-4)(x-1) = \ln 4$

$(5x-4)(x-1) = 4$

$5x^2 - 9x + 4 = 4$

$5x^2 - 9x = 0$

$x(5x-9) = 0$

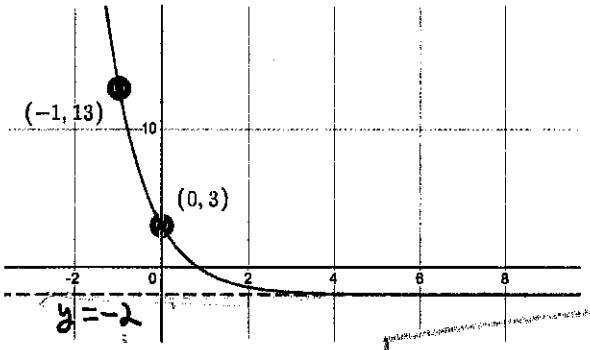
$x = 0$ extraneous.

$5x - 9 = 0$ $\boxed{x = \frac{9}{5}}$

You may complete your work on these sheets for these graphs

For each graph, write an appropriate function as indicated:

Q7.



$y = ab^x - 2$

$3 = ab^0 - 2$

$5 = a$

$y = 5b^x - 2$

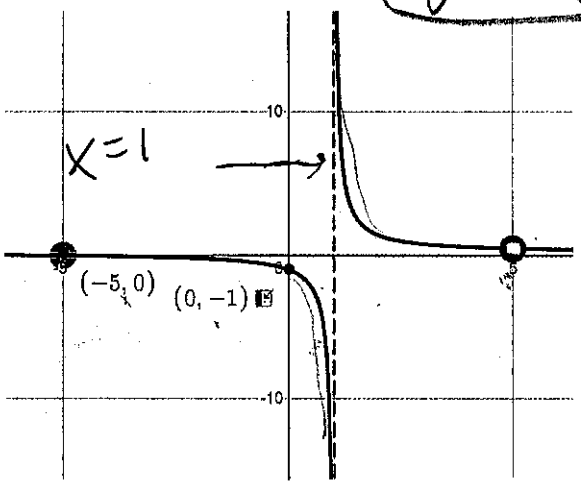
$13 = 5b^{-1} - 2$

$15 = 5b^{-1}$

$\frac{3}{1} = \frac{1}{b}$ $\quad b = \frac{1}{3}$

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

Q8.

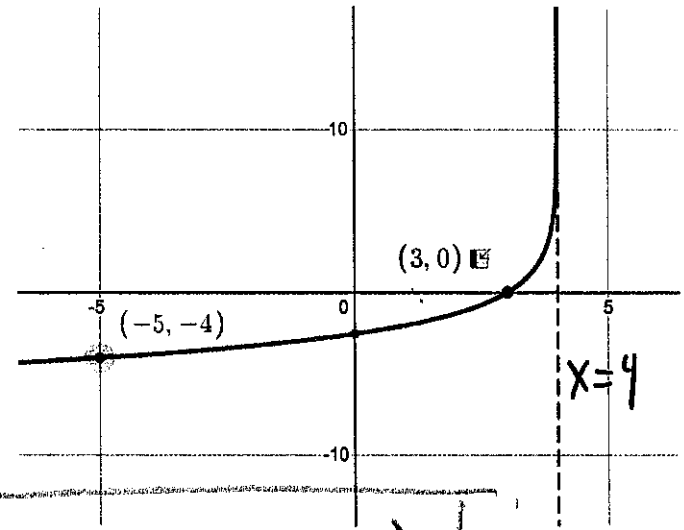


$\frac{1(x+5)(x-5)}{5(x-1)(x-5)}$

$-1 = \frac{a(0+5)}{0-1}$ $\quad -1 = -5a$

$\frac{1}{5} = a$

Q9.



$y = a\log(b(x-4)) + k$

$y = a\log(-(x-4)) + k$

$0 = a\log(-(3-4)) + k$

$0 = a\log 1 + k$

$0 = k$

$-4 = a\log(-(-5-4))$

$-4 = a\log(9)$

$\frac{-4}{\log 9} = a$

$y = \frac{-4}{\log 9}\log(-(x-4))$