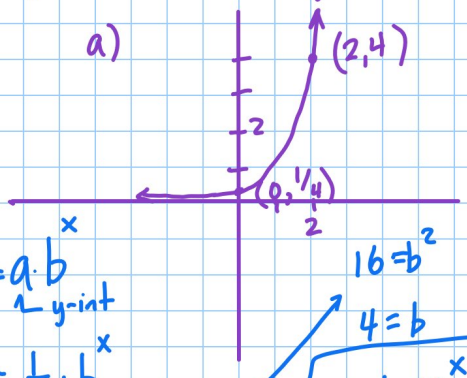
PPP Chapter 1

1) Find the equation for each graph:

a)



$y = a \cdot b^x$ ← y-int

$y = \frac{1}{4} \cdot b^x$

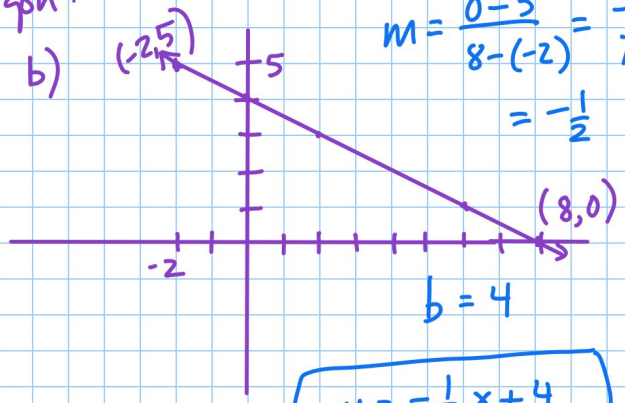
$4 = \frac{1}{4} \cdot b^2$

$16 = b^2$

$4 = b$

$y = \frac{1}{4} \cdot 4^x$

b)



$m = \frac{0-5}{8-(-2)} = \frac{-5}{10} = -\frac{1}{2}$

$b = 4$

$y = -\frac{1}{2}x + 4$

2) Beehive rental charges $50 to rent a dingo for 5 hrs and $75 to rent a dingo for 10 hrs.

a) Write a linear function for Cost, C, of renting a dingo, for h hours.

b) What is the slope and what does it mean?

c) What is the cost of renting a dingo for 30 hrs?

d) If you have $125 budgeted, for how many hours can you rent the dingo?

a) (5, 50)

(10, 75)

$m = \frac{75-50}{10-5} = \frac{25}{5} = 5$

$50 = 5 \cdot 5 + b$

$25 = b$

$C = 5h + 25$

b) $m = 5$

$5 per hour rental

c) $C = 5 \cdot 30 + 25$

$C = 150 + 25$

$C = \$175$

d) $125 = 5h + 25$

$100 = 5h$

$h = 20$ hours

3) Solve for x:

a) $\frac{400}{40} = \frac{40e^{x-5}}{40}$

$10 = e^{x-5}$

$\ln 10 = \ln e^{x-5}$

$2.303 = x - 5$

$x = 7.303$

b) $7^x = 64$

$\ln 7^x = \ln 64$

$x \ln 7 = \ln 64$

$x = \frac{\ln 64}{\ln 7}$

$x = 2.137$

4) Find k so the following function is continuous

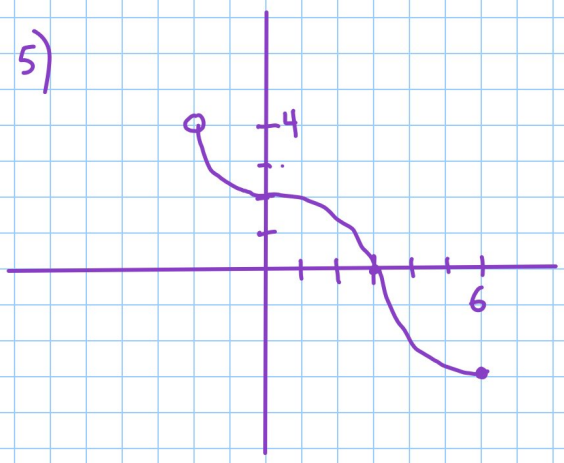
$$f(x)=\begin{cases} kx^2+3 & x<-1 \\ x+6 & x\geq -1 \end{cases}$$

$k(-1)^2+3=-1+6$

$k+3=5$

$\boxed{k=2}$

5)



a) What is the domain? $(-2,6]$

b) What is the range? $[-3,4)$

c) List all roots. 3

d) List intervals of decreasing. $(-2,6)$

e) Is it concave up or concave down at $x=5$? up

f) Is it invertible? yes

6) A 425-lb person is losing weight. If t = number of weeks since weight loss begins, write a formula for weight, W as a function of t if:

a) Weight decreases at 4 lbs per week

b) Weight decreases at 1% per week.

c) Find the person's weight after 1 year (52 weeks) in each case.

a) $W=425-4t$

b) $W=425\cdot 0.99^t$

c) 217 lbs linear $\Rightarrow 425-4\cdot 52$

252 lbs exponential $\Rightarrow 425\cdot 0.99^{52}$

7) Given $f(x) = 5x^2 - 2x + 3$, find:

a) $f(-5)$

$5(-5)^2 - 2(-5) + 3$

$= 125 + 10 + 3$

$\boxed{= 138}$

b) $f(-5+h)$

$5(-5+h)^2 - 2(-5+h) + 3$

$= 5(25 - 10h + h^2) + 10 - 2h + 3$

$= 125 - 50h + 5h^2 + 10 - 2h + 3$

$\boxed{= 5h^2 - 52h + 138}$

c) $f(-5+h) - f(-5)$

$5h^2 - 52h + 138 - 138$

$\boxed{= 5h^2 - 52h}$

d) $\dfrac{f(-5+h) - f(-5)}{h}$

$= \dfrac{5h^2 - 52h}{h}$

$= \dfrac{h(5h - 52)}{h}$

$\boxed{= 5h - 52}$