

# 88 Sales

$$m = \frac{65.23 - 42.91}{1} = 22.32$$

$$m = \frac{108.25 - 65.23}{1} = 43.02$$

$$m = \frac{156.51 - 108.25}{1} = 48.26$$

$$m = \frac{170.91 - 156.51}{1} = 14.4$$

$$m = \frac{182.90 - 170.91}{1} = 11.89$$

$$m = \frac{233.72 - 182.90}{1} = 50.82$$

(a) from

2014 to 2015

$$m = \text{AROC} = \frac{50.92 \text{ mill}}{1 \text{ year}}$$

(b) from

2009 to 2015

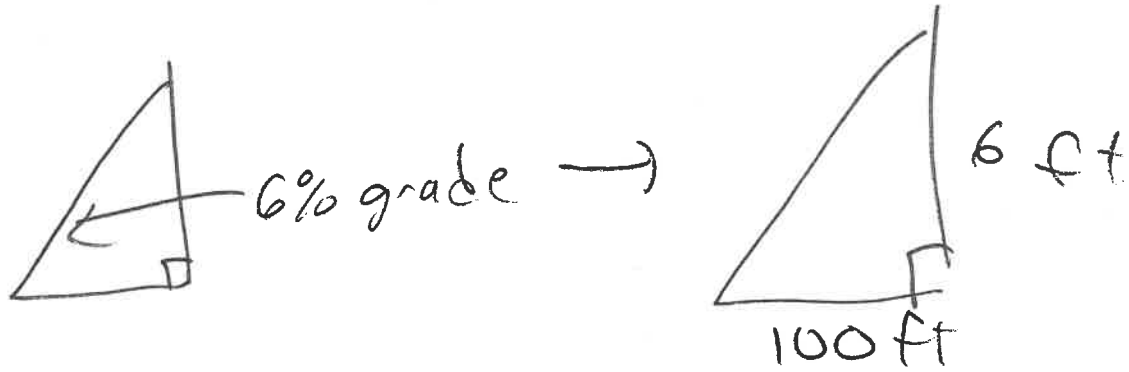
$$m = \frac{233.72 - 42.91}{15 - 9} = 31.80$$

$$\text{AROC} = 31.80 \frac{\text{mill}}{\text{year}}$$

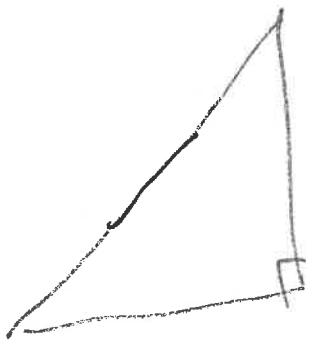
from 2009 to 2015

(c)

# 89 Road Grade




for every 6ft of vertical change  
100ft of horizontal change

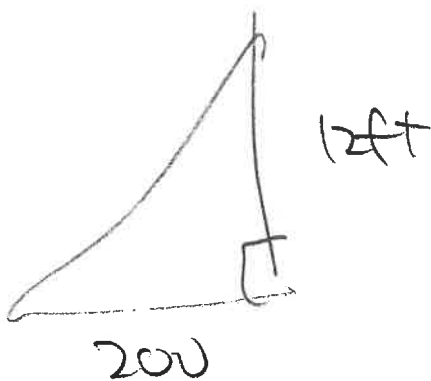


this question  
is awkwardly  
written


It implies 200



much  
tougher  
problem  
than

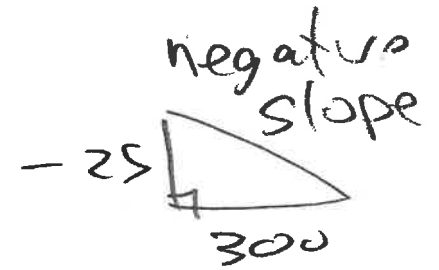
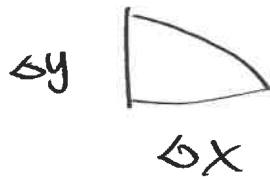
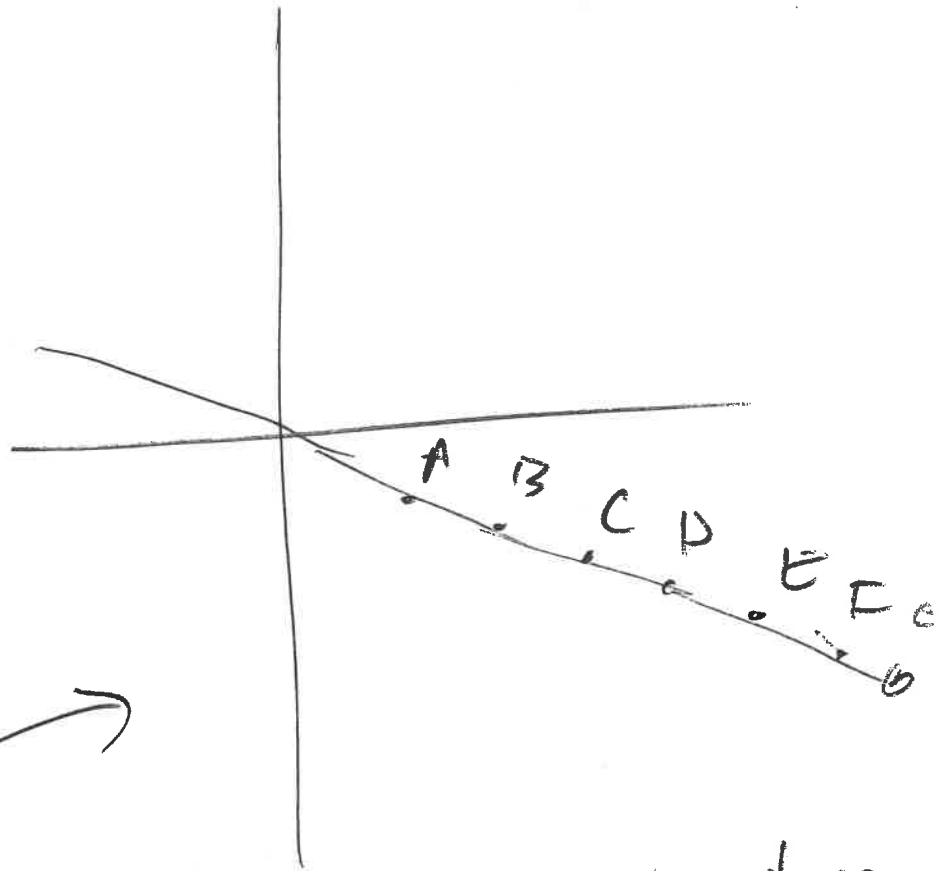


but it probably  
means



90

X	y
300	-25 (A)
600	-50 (B)
900	-75 (C)
1200	-100 (D)
1500	-125 (E)
1800	-150 (F)
2100	-175 (G)



$$m = \frac{-25}{300} = -\frac{1}{12}$$

$$y = mx + b$$



$$y = -\frac{1}{12}x$$

OR

$$y = mx + b$$

$$-25 = \frac{-1}{12}(300) + b$$

$$-25 = -25 + b$$

$$b = 0$$

$$-25 = \frac{1}{12}(300) + b$$

$$-25 = -25 + b$$

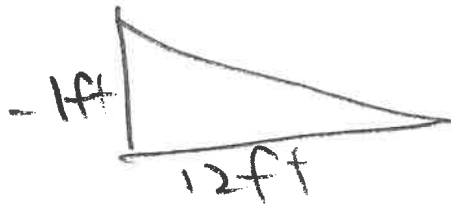
$$b = 0$$

90 a-b-c Done

90d meaning of slope

$$m = \frac{-1}{12}$$

for every 1 foot V. drop  
12 feet of H change



90e

$$\text{grade} = \frac{-1}{12} = -0.08\overline{3}$$

← approximately equal

acceptable grade suggested

$$\frac{-8}{100} = -0.08$$

Sign is OK not perfectly accurate

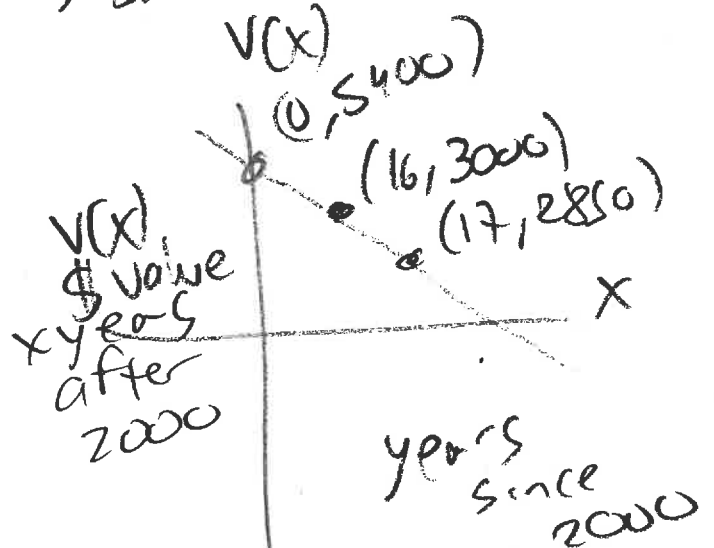
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90 As written

we know (16, 3000)

years  
after  
2000

↳ \$ value



$$m = \frac{-150 \$}{\text{year}} \quad \text{So}$$

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

$$y = -150(x - 16) + 3000$$

$$y = -150x + 2400 + 3000$$

$$y = -150x + 5400$$

OR  $y = mx + b$

$$V(x) = -150x + 5400$$

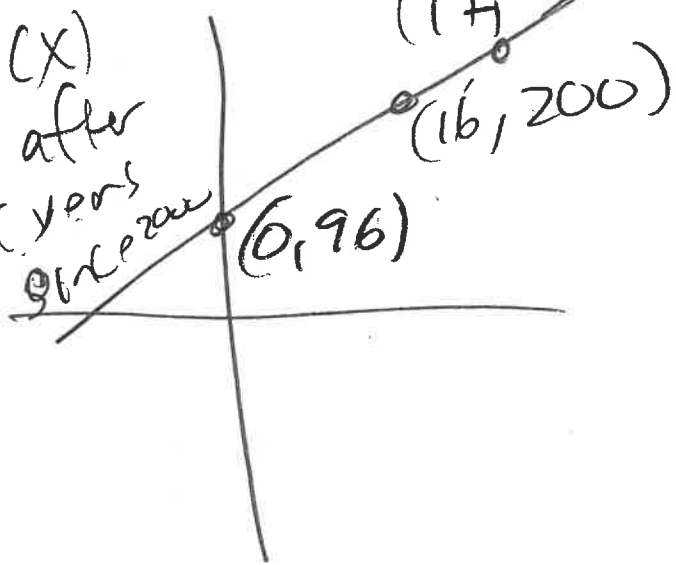
↳ years since 2000

$$3000 = -150(16) + b$$

$$3000 = -2400 + b \rightarrow b = 5400$$

92) As written

$v(x)$   
\$ after  
 $x$  years  
since 2000



$$m = \frac{+650\$}{\text{year}}$$

(16, 200)

16  
years  
after  
2000

↳ value  
at  
 $x=16$

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

$$y = 65(x - 16) + 200$$

$$y = 65x - 104 + 200$$

$$y = 65x + 96$$

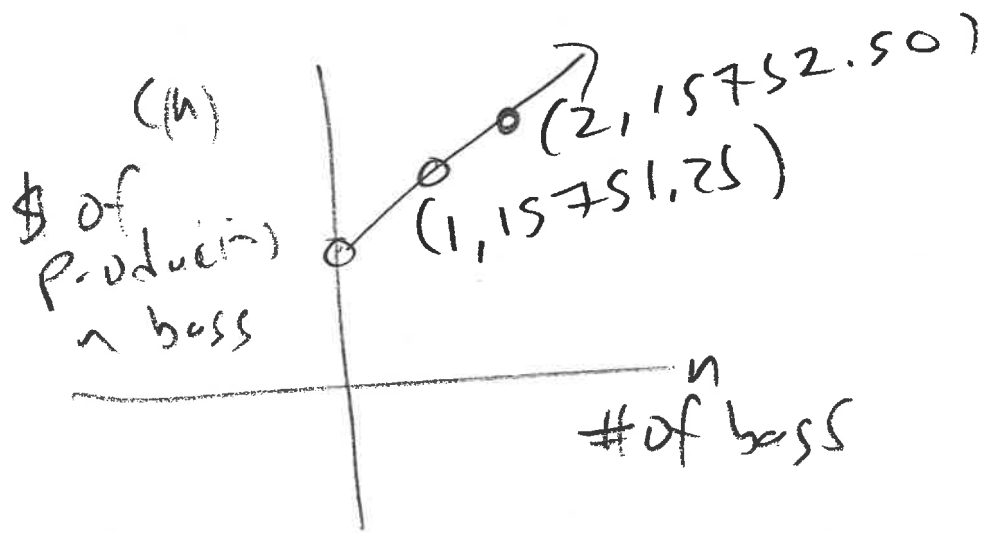
93

$$C(n) = 1.25n + 15750$$

$$n > 0$$

$C(n)$  = cost of producing  
 $n$  computer bags

$n$  = number of computer bags



94

monthly salary = 5000 (fixed)  
commission 7% of sales (variable)

$$y = f(x) = m x + b$$

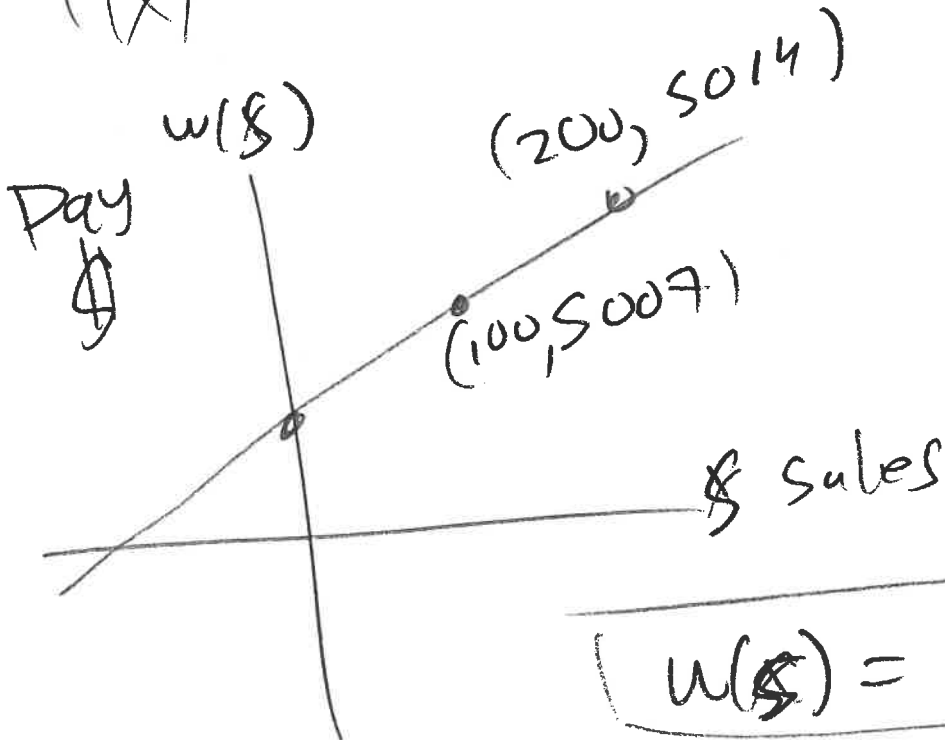
base pay  
before  
commission

pay  
in  
terms  
of  
sales

commission

Sales

$$f(x) = 0.07x + 5000$$



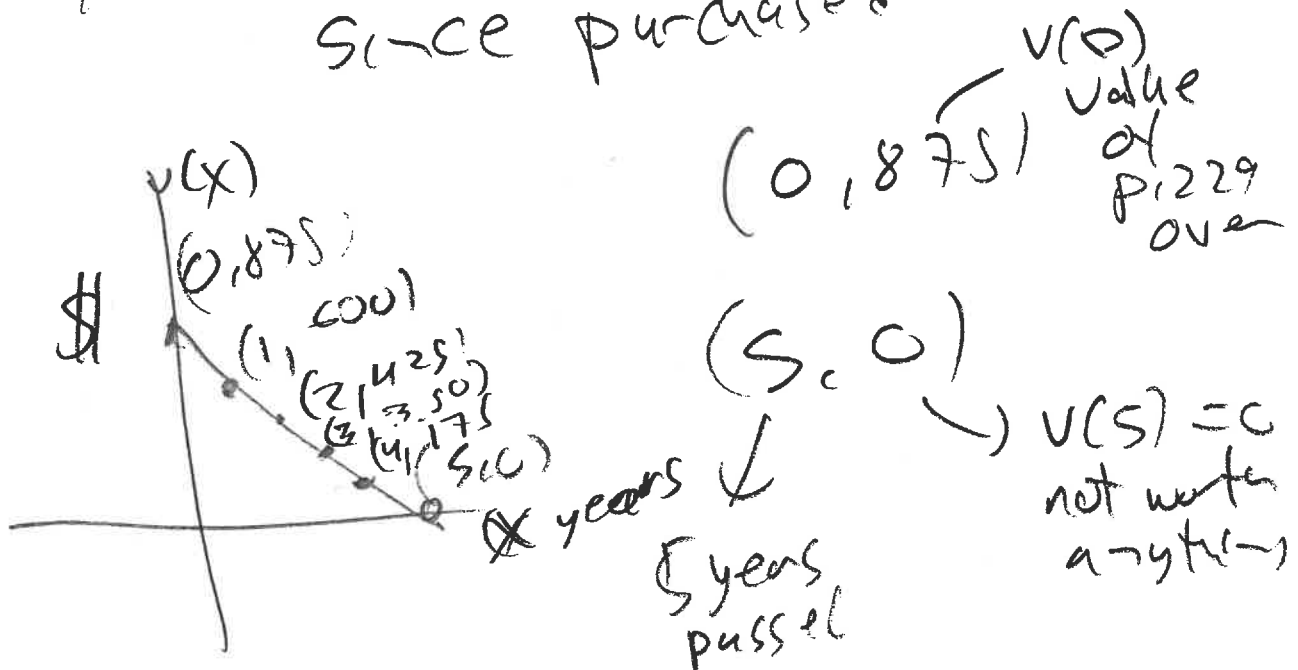
$$w(\$) = 0.07S + 5000$$



# (95) Depreciation

$V(x)$  = value over time

$x$  = number of years since purchased

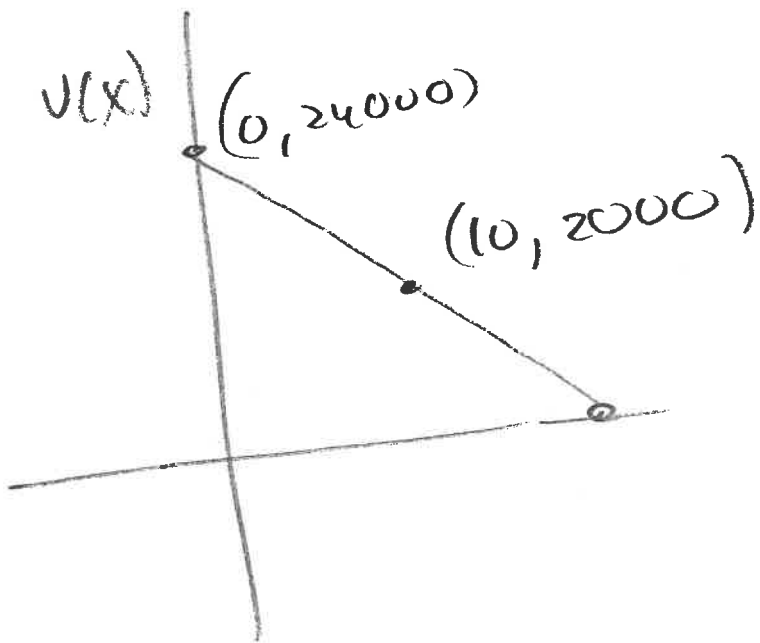


$$m = \frac{0 - 875}{5 - 0} = \frac{-875}{5} = -175$$

$$m = \frac{-175 \$}{\text{year}}$$

$$V(x) = -175x + 875$$

# 96 Deprecation.



$$m = \frac{2000 - 24000}{10 - 0}$$

$$= \frac{-22000}{10}$$

$$m = \frac{-2200 \$}{y}$$

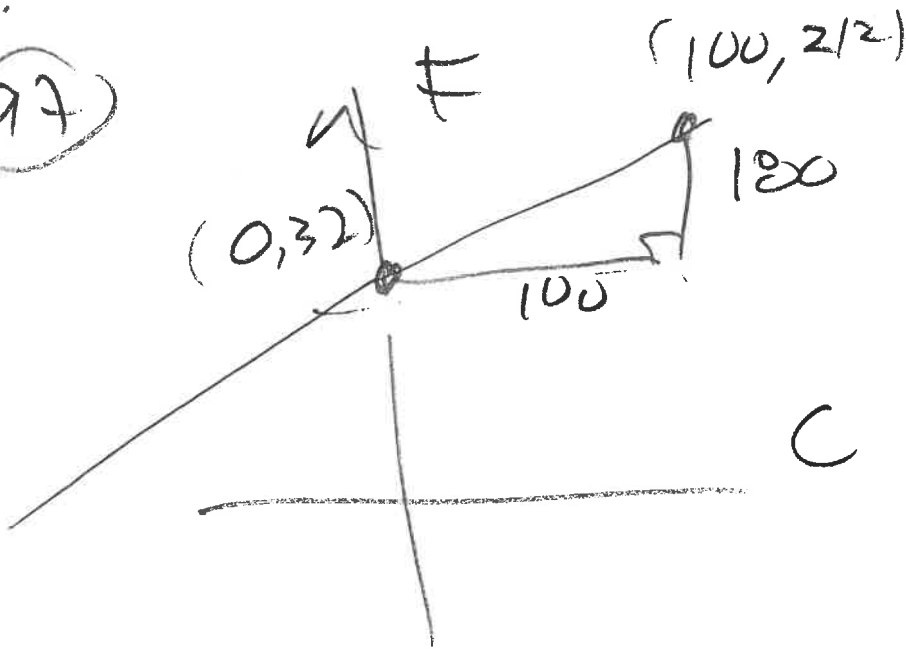
$$b = 24000$$

$y = mx + b \rightarrow y = -2200x + 24000$

Value of equipment  
↘ years after purchase

$$V(x) = 24000 - 2200x$$

(97)

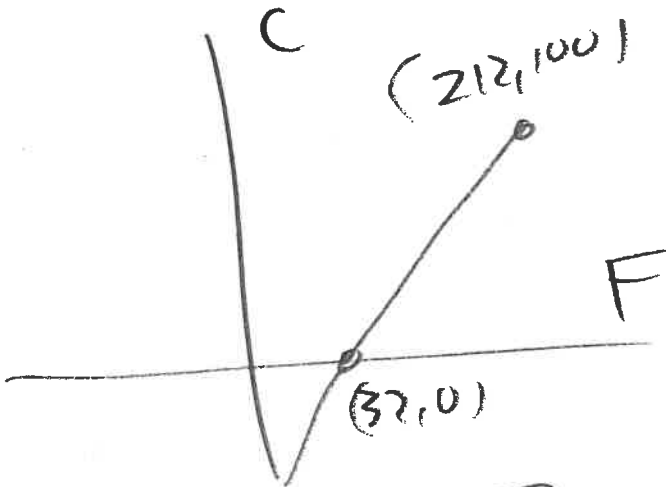


- (C, F)
- (0, 32)
- (100, 212)

$$m = \frac{212 - 32}{100 - 0} = \frac{180}{100} = \frac{9}{5}$$

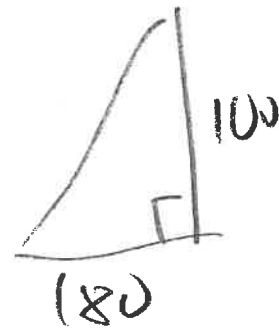
$$F(C) = \frac{9}{5}C + 32$$

OR



- (F, C)
- (32, 0)
- (212, 100)

$$C(F) = \frac{5}{9}(F - 32)$$



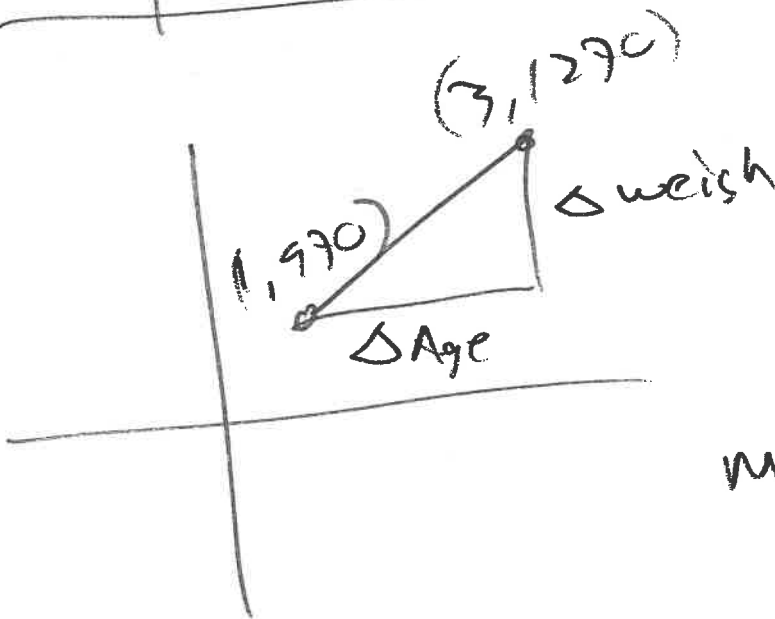
$$m_2 = \frac{100}{180} = \frac{5}{9}$$

$$C(F) = \frac{5}{9}F - \frac{160}{9}$$

98

Age (years)	Weight (g)
1	970
3	1270

↳  $m = \frac{160g}{1 \text{ year}}$   
 brain's weight changes by 150g per year



$$m = \frac{1270 - 970}{3 - 1}$$

$$= \frac{300}{2}$$

$$m = 150$$

$$m = \frac{\Delta \text{weight}}{\Delta \text{Age}}$$

$$m = \frac{150g}{1 \text{ year}}$$

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

$$y = 150(x - 1) + 970$$

$$= 150x - 150 + 970$$

$$y = 150x + 820$$

9  $w(x) = 150x + 820$

$m = \frac{150g}{1 \text{ year}}$

start weight 820

98 (c)

$$W(2) = 150(2) + 820$$
$$= 300 + 820$$

$$W(2) = 1120 \text{ grams}$$

at age 2

(d) Per Google

(99) Cost 42000 — fixed cost  
 \$9.50/hr — truck use cost  
 11.50/hr — driver cost  
 cost per hour  
 $C(x) = 42000 + (9.5 + 11.50)x$   
 $= 42000 + 21.0x$

$$C(x) = 42000 + 21x$$

$$\text{Revenue} = 45x$$

$$R(x) = 45x$$

$\downarrow$  Revenue  
 $\downarrow$  # of hrs truck is used  
 PU  
 hour

$$P(x) = R(x) - C(x)$$

$$= 45x - (21x + 42000)$$

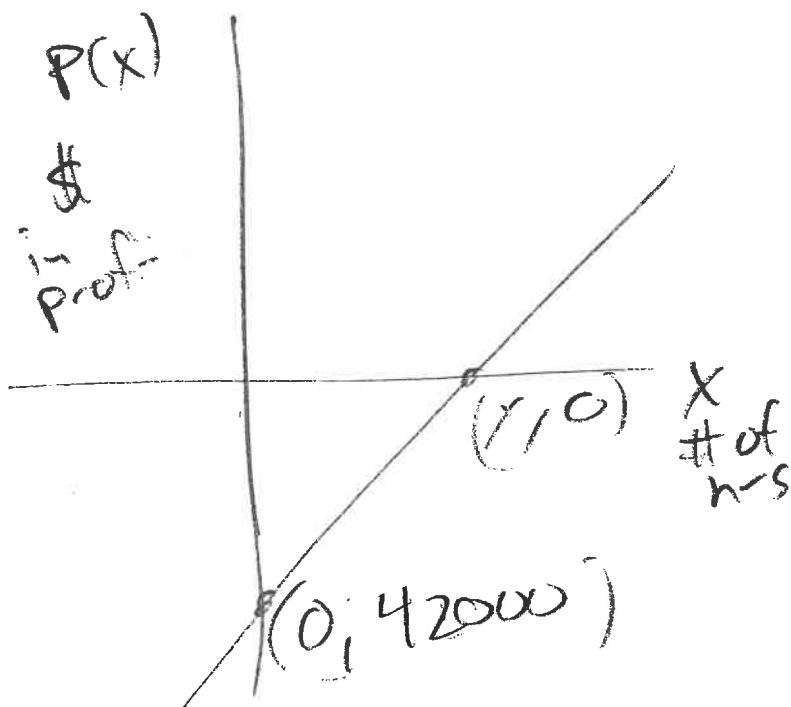
$$P(x) = 24x - 42000$$

99 cont

a)  $C(x) = 42000 + 21x$

b)  $R(x) = 45x$

c)  $P(x) = 24x - 42000$



$$P(x) = 24x - 42000$$

$$0 = 24x - 42000$$

$$42000 = 24x$$

$$x = \frac{42000}{24}$$

$$x = 1750$$

It will take 1750 hrs to payoff truck (area  $P(x) = 0$ )

$P(x) > 0$  when  $x > 1750$  hrs.