Unit 1

1a) $5y+9=2y-3$

$3y=-12$

$\boxed{y=-4}$

1b) $3-2t=5-5t$

$3t=2$

$\boxed{t=\frac{2}{3}}$

1c) $3(y-2)-2(y-3)=-11$

$3y-6-2y+6=-11$

$\boxed{y=-11}$

1d) $5(3-a)-2(a-7)=113$

$15-5a-2a+14=113$

$-7a=84$

$\boxed{a=-12}$

1e) $(x,y)=(2,1)$

1f) $(x,y)=(4,-5)$

1g) $(x,y)=(4,3)$

1h) $(x,y)=(3,5)$

1i) $(x,y)=(2,7)$

1j) $(x,y)=(3,-2)$

* See full solutions to 1e-j at the end of the package

2. $A=\frac{12000+3n}{n}$

a) $n=5000$

$A=?$

$A=\frac{12000+3(5000)}{5000}$

$\boxed{A=\$5.40}$

b) $n=?$

$A=\$3.25$

$3.25=\frac{12000+3n}{n}$

$3.25n=12000+3n$

$0.25n=12000$

$\boxed{n=48000}$

(3) $\frac{L + 2D - F + \sqrt{A}}{2.37} = 12$

$L = 16.6$
$D = 0.2$
$F = 1.26$
$A = ?$

$\frac{16.6 + 2(0.2) - 1.26 + \sqrt{A}}{2.37} = 12$

$15.74 + \sqrt{A} = 28.44$

$\sqrt{A} = 12.7$

$\boxed{A = 161.29}$

(4) x = oil
y = gasoline

$4x + 50y = 42.50$
$3x + 35y = 30.30$

$(x, y) = (\$2.75, \$0.63)$

$\therefore$ 1L oil = \$2.75
1L gasoline = \$0.63

(5) x = adult tickets
y = student tickets

$6x + 15y = 48$
$8x + 7y = 38$

$(x, y) = (3, 2)$

adult tickets = \$3/ticket
student ticket = \$2/ticket

(6)

dimes (\$0.1)	x	$0.1x$
quarters (0.25)	y	$0.25x$
Total	32	6.20

$x + y = 32$
$0.1x + 0.25y = 6.20$
$(x, y) = (12, 20)$

12 dimes
20 quarters

adult	$20	x	$20x$
child	$13	y	$13y$
Total		400	6250

$$x+y=400$$
$$20x+13y=6250$$

$$(x, y) = (150, 250)$$

150 adults
250 child

Unit 2

1a) $y = 0.25x + 200$

b) $m = 0.25$; It cost \$0.25 of printing per pamphlets

c) when $x=0$, $y=200$; when $x=2500$, $y=825$

d) y-intercept = 200 ; It cost \$200 to place the order with zero pamphlets.

e) $y = 0.25x + 200$
$y = 0.15x + 350$

$(x, y) = (575, 1500)$

need 575 pamphlets

2a). $y = 6.5x + 30$

b) $m = 6.5$; It cost \$6.50 per specialty channel

c) $b = 30$; fixed monthly fee is \$30.

d) $y = 6.5x + 30$

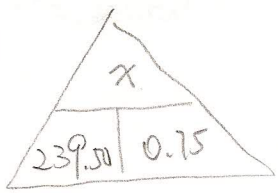
$y = 5x + 45$

$(x, y) = (10, 95)$

$\therefore$ 10 specialty channel.

Unit 3

1 a)



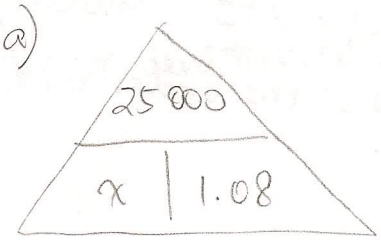
$x = 239.5\,(0.75)$

$= \$179.63$

b) Sale price + tax $= \$179.63\,(1.13)$

$= \$202.98$

2 a)



$x = \dfrac{25000}{1.08}$

$= \$23148.15$

b) Andre x

Karen y

\$23148.15

$x + y = 23148.15$

$x = y + 4000$

$\therefore y + 4000 + y = 23148.15$

$2y = 19148.14815$

$y = \$9574.08$

$x = 9574.07 + 4000$

$= \$13574.07$

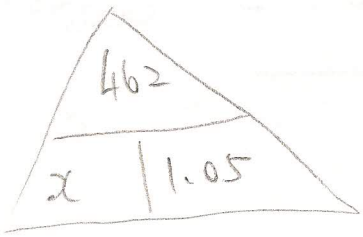
Andre - \$13574.07

Karen - \$9574.08

$\%\uparrow = \frac{477-424}{424} \times 100$

$\%\uparrow = 12.5\%$

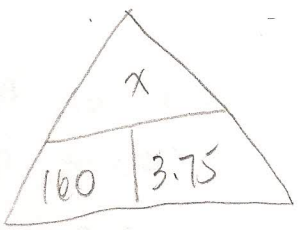
3b)



$x = \frac{462}{1.05}$

$x = 440$

4a)



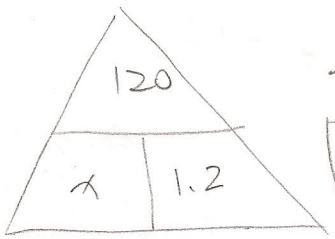
$x = 160(3.75)$

$x = 600$

b) $\%\uparrow = \frac{160-120}{120} \times 100$

$\%\uparrow = 33.33\%$

c)



$x = \frac{120}{1.2}$

$x = 100$

Unit 4 : Ratios

1. $\frac{\text{hit}}{\text{purchase}} = \frac{9}{2}$

$\frac{4203}{x} = \frac{9}{2}$

$9x = 8406$

a) $x = 934$

b) $\$80(934)$

$= \$74\,720$ total purchase

Unit 4

(2)

	Actual #		After additional members
Females	$7x$	$+15$	$7x+15$
Males	$8x$	$+20$	$8x+20$

$$\frac{7x+15}{8x+20} = \frac{5}{6}$$

$$42x + 90 = 40x + 100$$

$$2x = 10$$

$$x = 5$$

$\therefore$ Females $= 7(5) = 35$
Males $= 8(5) = 40$

(3)

	Actual #
Boys	$4x$
Girls	$5x$
Total	144

$$4x + 5x = 144$$

$$9x = 144$$

$$x = 16$$

$\therefore$ Boys $= 4(16) = 64$
Girls $= 5(16) = 80$

(4)

	Actual #	Salary/person	
Higher	$3x$	\$20	$20(3x) = 60x$
lower	$10x$	\$12	$12(10x) = 120x$
Total			2160

$$60x + 120x = 2160$$

$$180x = 2160$$

$$x = 12$$

$\therefore$ higher $= 3(12) = 36$
lower $= 10(12) = 120$

Total employees $= 156$.

Unit 5

1. $A = 100000$
$P = 80000$
$r = ?$
$n = 3$

$$A = P(1+r)^n$$

$$100000 = 80000(1+r)^3$$

$$1.25 = (1+r)^3$$

$$1.077217345 - 1 = r$$

$$r = 0.077217345$$

$\therefore r = 7.72\%$

Unit 5

2. $A =$
$P = 10000$
$r =$
$n = 5$

Choice 1:
$A = 10000\left(1 + \frac{.06}{2}\right)^{10}$
$= \$13439.16$

Choice 2:
$A = 10000\left(1 + \frac{.055}{365}\right)^{1825}$
$= \$13165.03.$

Choice 1 is better by $274.13

3. $A = 160\,000$
$P = 80\,000$
$r = 0.2$
$n = ?$

$160\,000 = 80000(1.2)^n$
$2 = 1.2^n$
$n = \frac{\log 2}{\log 1.2}$
$n = 3.8$
$n \doteq 4$ years

4. $A = 15000$
$P =$
$r = 0.10$
$n = 3$

$15000 = P\left(1 + \frac{.10}{12}\right)^{36}$
$15000 = 1.348181842P$
$P = \$11126.10$

Unit 6

1. 9 Total

a) i) $P(\text{red}) = \frac{4}{9}$
ii) $P(\text{not blue}) = \frac{6}{9} = \frac{2}{3}$

b) (i) $P(W \& W) = \left(\frac{2}{9}\right)\left(\frac{1}{8}\right)$
$= \frac{1}{36}$

(ii) $P(BR \text{ or } WR) = \left(\frac{3}{9}\right)\left(\frac{4}{8}\right) + \left(\frac{2}{9}\right)\left(\frac{4}{8}\right)$
$= 5/18$

(2)

All in %	≥ 40 yrs old	< 40 yrs old	Total
Text < 1 hr/day	0.25	.35	0.6
Text ≥ 1 hr/day	0.10	0.3	0.4
total	0.35	.65	1

b) $P(\geq 40 \mid \geq 1\text{hr}) = \frac{0.1}{0.4}$

$= \frac{1}{4}$

c) $P(< 1\text{hr} \mid < 40) = \frac{0.35}{0.65}$

$= \frac{7}{13}$.

Unit 1 # 1e to 1j.

1e) $3x+2y=8$ --- ①
$x-12y=-10$ --- ② × 3

$3x+2y=8$
$-(3x-36y=-30)$

$38y=38$
$y=1$

sub $y=1$ into equation ②

$x-12(1)=-10$
$x=-10+12$
$x=2$

$\therefore (x,y)=(2,1)$

1f) $2x-y=13$ --- ① × 2
$4x+3y=1$ --- ②

$4x-2y=26$
$-(4x+3y=1)$

$-5y=25$
$y=-5$

sub $y=-5$ into ①

$2x-(-5)=13$
$2x+5=13$
$2x=8$
$x=4$
$\therefore (x,y)=(4,-5)$

1g) $2x+6y=26$ --- ① × 5
$5x-3y=11$ --- ② × 2

$10x+30y=130$
$-(10x-6y=22)$

$36y=108$
$y=3$

Sub $y=3$ into ①

$2x+6(3)=26$
$2x=26-18$
$2x=8$
$x=4$
$\therefore (x,y)=(4,3)$

1h) $3x+4y=29$ --- ① × 2
$2x-5y=-19$ --- ② × 3

$6x+8y=58$
$-(6x-15y=-57)$

$23y=115$
$y=5$

sub $y=5$ into ①

$3x+4(5)=29$
$3x+20=29$
$3x=9$
$x=3$
$(x,y)=(3,5)$

ii) $y = 9 - x$ --- ①
$y = 11 - 2x$ --- ②

$9 - x = 11 - 2x$

$x = 11 - 9$

$x = 2$

sub $x = 2$ into ①

$y = 9 - 2$

$y = 7$

$(x, y) = (2, 7)$

~~4~~ j) $y = 1 - x$ --- ①
$y = -11 + 3x$ --- ②

$1 - x = -11 + 3x$

$-3x = -12$

$3x = 12$

$x = 4$

sub $x = 4$ into ①

$y = 1 - 4$

$y = -3$

$\therefore (x, y) = (4, -3)$