Assets test :

1. Anna and Barry are a couple and both are eligible. Anna has employment income $380 a fortnight and Barry has employment income of $550 a fortnight. The couple have financial assets of $230 000. Use income test to calc fortnightly aged pension

$$TFI = (380 - 250) + (550 - 250) + \frac{0.02 \times 79600 + 0.035 \times 150400}{26}$$

$$= 430 + \frac{1592 + 5264}{26}$$

$$= 430 + 264$$

$$= 644$$

Anna and Barry receive a fortnightly pension of $541.50

$$TP = 644 \times 2 - (694 - 284) \times 0.50$$

$$= 1288 - 205$$

$$= \$1083$$

2. Calc fortnightly income for single homeowner earning $400/fortnight doing odd jobs w/assets valued at $480 000, excluding the pensioner's home (financial assets of $180 000)

$$\text{Fortnightly pension} = \$854.30 - \frac{480\,000 - 202\,000}{1000} \times 1.50$$

$$= 854.30 - 417$$

$$= \$437.30$$

$$\text{Income test} = \$400 - 250 + \frac{0.02 \times 48000 + 0.035 \times 152\,000}{26}$$

$$= 150 + 215$$

$$= \$365$$

∴ This will be paid bc it's lower

Fortnightly pension (Based on income test) $= 854.30 - (365 - 160) \times 0.50$

$= 854.30 - 102.50$

$= 751.80$

Income test :

1. Using the income test calculate the fortnightly pension for a single pensioner earning $400 per fortnight doing odd jobs and having financial assets of $150 000

Working: Fortnightly pension $= 854.30 - (324 - 160) \times 0.5$

$= 854.30 - 82.00$

$= \$772.30$

$$\text{Total fortnightly income} = 400 - 250 - \frac{2\% \text{ of } 48000 + 3.5\% \text{ of } 102\,000}{26}$$

(150000 − 48000)

Earned fortnightly income − work bonus + deemed fortnightly income

$$= 150 + \frac{0.02 \times 48000 + 0.035 \times 102\,000}{26}$$

$= 150 + 174$ (rounded to nearest dollar)

$= \$324$

2. Using income test, calc fortnightly age pension for each pensioner of a couple w/financial assets of $58 800 and a combined fortnightly earned income of $180

Working: $$\text{Total fortnightly income} = 180 - 180 + \frac{2\% \text{ of } 19600 + 3.5\% \text{ of } 500400}{26}$$

Because you can't do 180 − 250, so it's just 180

$$= 0 + \frac{0.02 \times 79600 + 0.035 \times 500400}{26}$$

$= 735$ (rounded to nearest dollar)

$$\text{Pension} = 1288 - (735 - 284) \times 0.5$$

$= 1288 - 225.50$

$= \$1062.50$

Each pensioner receives $531.25

Pensions :

Person qualifies for Gov Pension will be paid $656.50/fortnight as long as they don't earn more than $150 at the time their pension reduced for every 40 cents in every $ earnings over $150

a) Woman qualifies for this pension starts a part time job for 10 hrs/week that pays $16.50/hr

i) calc wkly earnings

Working: $10 \times 16.50 = \$165.00$

ii) calc fortnightly earnings

Working: $165 \times 2 = \$330$

iii) will her fnightly pension reduced and by how much?

Working: $330 - 150 = 180$

$180 \times 0.40 = 72$

$656.50 - 72 = \$584.50$

iv) What will be the total amount of money she'll earn from her job and pension per fortnight?

Working: $330 + 584.50$

$= \$914.50$

v) Her part time work has reduced her hrs/wk to 4 hrs, will her pension still be reduced? Justify

Working: $4 \times 16.50 = 66$

$66 \times 2 = \$132$

It will not be reduced as it's below $150

Percentages

÷100 move decimal 2 places left

×100 move dp 2 places right

Mark up − $(1 + (\% \div 100)) \times$ Quantity

Discount − $(1 + (\% \div 100)) \times$ Quantity

Profit = Selling price − Cost price

Loss = Cost price − Selling price

% Profit = $\frac{\text{Prof made when selling}}{\text{Amt you paid for item}} \times 100$

% Loss = $\frac{\text{Loss made when selling}}{\text{Amt you paid for item}} \times 100$

Rates :

Standard rate: ×1

Double time: ×2

Time & a half: ×1.5

Triple time: ×3

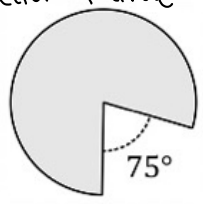
Shares

P/E = $\frac{\text{Market price per share}}{\text{Earnings per share}}$

Dividend per share = $\frac{\text{Net profit}}{\text{Total shares}}$

Measurement

Sector of circle



D = 16mm

i) Determine area

θ = 360 − 75

= 285

r = 16 ÷ 2

= 8

$A = \frac{285}{360} \times \pi (8)^2$

$= 159mm^2$

ii) Determine Perimeter

Arc length: $L = \frac{285}{360} \times 2\pi (8)$

$= 39.8$

P = 39.8 + 2(8)

= 55.8mm

2. company makes spherical floats w/external radius of 32cm

a) External surface coated with paint that costs $85/square meter. Determine cost of paint

r = 0.32m

$A = 4\pi (0.32)^2$

$= 1.2868m^2$

Cost = 1.2868 × 85

= $109.38

b) Each float is made from inner solid steel sphere of radius 11cm. Given that the weight of one cubic cm of steel and polystyrene are 6.4 and 0.028 g respectively, determine the total weight of materials

Whole volume: $V = \frac{4}{3}\pi (32^3) = 137258cm^3$

Steel volume: $V_S = \frac{4}{3}\pi (11)^3 = 5575cm$

Polystyrene: $V_P = 137258 - 5575 = 131683cm^3$

Steel weight: $W_S = 5575 \times 6.4 = 35682g$

Polystyrene: $W_P = 131683 \times 0.028 = 3687g$

> total weight: W = 35682 + 3687

= 39 369g

SA big O $= 4\pi r^2 \div 2 + \pi r^2$

$= (4 \times 11) \div 2 + \pi 11^2 - \pi 6^2$

$= 1027.30cm^2$ (2.d.p)

Surface Area:

SA small Semi O $= \frac{4 \times \pi r^2}{2}$

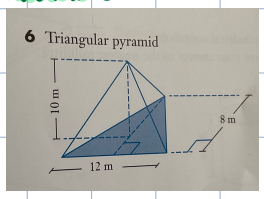
$= (4\pi 6^2) \div 2$

$= 226.19cm^2$

TSA = 1027.30 + 226.19

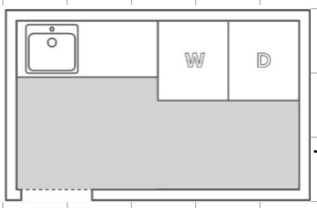
$= 1253 cm^2$

Volume



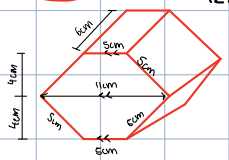
Vol = ⅙ × 12 × 8 × 10

$= 160cm^3$



SF = 1:50

Determine how many tiles are needed to cover the grey shaded area, assuming no space is left between tiles and that once cut, the wasted part of a tile can't be reused



A of trapezium $= \frac{a \times b}{2} \times h$

$= \frac{6 + 11}{2} \times 4$

$= 32cm^2$

Front & back = 32 × 4

$= 128cm^2$

Area Rectangle = 6 × 5 × 6

$= 180cm^2$

TSA = 128 + 180

$= 308cm^2$

$A_{trap} = \frac{12 + 24}{2} \times 8$

$= 144cm$

TSA = 144 × 2

$= 288cm^2$

A sides = 2 × 20 × 10

$= 400cm$

$A_\Delta = 24 \times 5$

$= 120cm^2$

Area top = 2 × 13 × 20

$= 520cm^2$

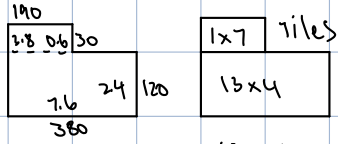
$A_{base} = 12 \times 20$

$= 240cm$

TSA = 288 + 120 + 520 + 240 + 400

$= 1568cm^2$

cm →



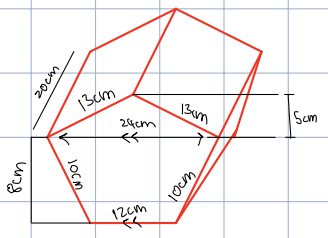
1×7 tiles

13×4

Lower rect: 7.6 ×50 ×50 24 → 380 ÷30 ÷30 120 → 13 × 4 = 52 tiles

Upper rect: 3.8 ×50 ×50 0.6 → 190 ÷30 ÷30 30 → 7 × 1 = 7 tiles

Total tiles: 52 + 7 = 59



Formulas (Perimeter)	Formulas (area)		Formula (SA)	Formula (vol)
Arc: $\frac{\theta}{360} \times 2\pi r^2$	Sector = $\frac{\theta}{360} \times \pi r^2$	Trapezium ½ × (a+b) × h	Sphere = $4\pi r^2$	Sphere = $\frac{4}{3} \times \pi r^3$
Sector: $\frac{\theta}{360} \times 2\pi r + 2r$	Quarter Circle = $\pi r^2 \div 4$		Cone = $\pi rs + \pi r^2$	Cone = $\frac{1}{3} \times \pi r^2 h$
Semi circle: $\pi r + 2r$	Semi circle = $\pi r^2 \div 2$			Pyramid = ⅓ × A of base × h

Currency exchange

$1 AUD buys:
- 0.68 USD ($)
- 0.6 Euro (€)

$1 USD Buys:
- 0.81 Euro (€)

Imagine Isabella forgot to convert $100 AUD at the start of her trip and left it in her bag the entire trip. How much did she save (to the nearest cent) by not putting this $100 AUD through the conversion process?

$\frac{Au}{US}\ \frac{1}{0.68} = \frac{100}{x}$ $x = \$68$ USD

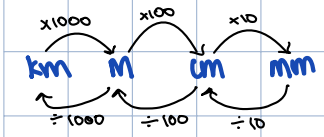
$\frac{US}{Euro}\ \frac{1}{0.81} = \frac{68}{y}$ $y = €55.08$ Euro

$\frac{Euro}{Au}\ \frac{0.6}{1} = \frac{55.08}{z}$ $z = \$91.80$ AUD

} Saved $8.20

Conversion

Price ÷ mL (or whatever unit) x 100 = Per ___

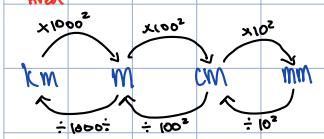


$1mL = 1cm^3$

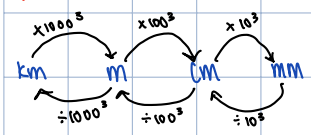
$1L = 1000cm^3$

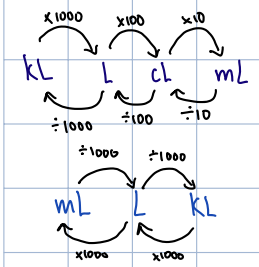
$1kL = 1m^3$

Area



Volume





Dividends

What is the dividend yield for this company?

$\frac{0.983}{12.63} \times 100 = 7.8\%$

How much profit does Ruben make if he sells all his shares as soon as they reach the value of $8.60 each

$(28.6 - 12.63) \times 460 = \$7346.20$

% Dividend = $\frac{\text{Annual dividend}}{\text{Market val per share}}$

Comp	ASX Code	Market value per share	Earnings/share (cents)	P/E ratios	Annual dividend (cents)	% dividend (%)
Hunter	HHL	1.81	14	A	13.5	B
iiNet	IIN	8.40	C	21.5	22.1	2.63
JB Hifi	JBH	15.59	126	12.4	D	5.28

Determine A, B, C & D

$A = \frac{1.81}{0.14} = 12.93$

$B = \frac{0.135}{1.81} = 0.075\%$

$C = \frac{8.40}{21.5} = 0.39$ cents

$D = 15.59 \times 5.28 = 82.3$

Spreadsheet

Item	Monthly Budget	Month 1	Month 2	Month 3	3-Month Total
Loan payment	405	405	405	405	1215
Insurance	225	225	225	225	*R*
Maintenance	108	0	458	45	503
Fuel	162	215	174	*Q*	582
Total	*P*	845	1262	858	*S*

Determine Q, R & S

$Q = 582 - (215 + 174) = 193$

$R = 3 \times 225 = 675$

$S = 2975$

Cell references

=A1 + A2 : (+) val of 2 cells

=A1 - A2 : (-) " "

=A1 x A2 : x " "

=A1 / A2 : (÷) val of 2 cells

=SUM(A1:A5) (+) the val of all cells between A1 & A5

=$A1 : Absolute cell ref (cell ref doesn't change when copied across cells)

Other finances

timesheet below gives hours worked by an employee. This industry pays its workers at the normal time rate for the first 8 hours (not including the unpaid lunch break), time and a half for the next 2 hrs, then double time for any hrs above this. Saturday's base rate increases to time and a half while Sunday's base rate is double time.

Calculate their wkly pay:

Name: Sophie		
Hourly rate: $43.50/hr		
Monday	6am – 6pm (inc. 1 hr break)	– 11
Tuesday	8am – 4:30pm (inc. 1 hr break)	– 7.5
Wednesday	8am – 4:30pm (inc. 1 hr break)	– 7.5
Thursday	8am – 4:30pm (inc. 1 hr break)	– 7.5
Friday	9am – 3pm (inc. 1 hr break)	– 5
Saturday	11am – 3pm	– 4
Sunday	11 am – 3pm (inc. 30 min break)	– 3.5

Working:

1.5 time: 2 + 4 = 6 hours

2 time: 1 + 3.5 = 4.5 hrs

Normal: 8

7.5 × 3 + 5

= 35.5 hours

The remaining 3 hrs from the 11 hrs, 2 will be paid 1.5 and the remaining 1 will be paid double (2)
(11 – 8 = 3) First 8 hrs paid at normal rate

Pay: 35.5 × 43.5 +
6 × 43.5 × 1.5 +
4.5 × 43.5 × 2
$2327.25

Matrices

The ticket sales shown in matrix X for three nights of the show.
Adult tickets cost $23 each and child tickets are $9 each

	Thu	Fri	Sat
Adult	102	128	152
Child	65	59	74

Show how to multiply matrix Z by another matrix to obtain a matrix that shows the total income over all 3 nights of the show

Working: $Z\begin{bmatrix}2981 & 3475 & 4162\end{bmatrix} \times \begin{bmatrix}1\\1\\1\end{bmatrix} = \begin{bmatrix}10568\end{bmatrix}$

The company wants more families to attend the show and allow children to attend for free. ↑ price of Adult tickets to $28
Determine whether profitable

Working: $\begin{bmatrix}28 & 0\end{bmatrix} \times \begin{bmatrix}102 & 128 & 152\\65 & 59 & 74\end{bmatrix} = \begin{bmatrix}2856 & 3584 & 4256\end{bmatrix}$

$\begin{bmatrix}2856 & 3584 & 4256\end{bmatrix} \times \begin{bmatrix}1\\1\\1\end{bmatrix} = 10696$

Yes, still profitable by $128

Matrices

Q3) A car rental company advertises the following table relating to the fixed car rental charges

	Reservable rate per day	On standby rate per day
1-2 year old Seca	$18	$18
New Seca	$21	$18
1-2 year old Conquest	$23	$21
New Conquest	$27	$23

a) A customer of this company receives a flat 15% discount on all fixed rates. By using a suitable matrix or otherwise find matrix L which shows the rental rates for this customer

$L = 0.85\begin{bmatrix}18 & 18\\21 & 18\\23 & 21\\27 & 23\end{bmatrix} - \begin{bmatrix}15.3 & 15.3\\17.85 & 15.3\\19.55 & 17.85\\22.95 & 19.55\end{bmatrix}$

100 – 0.15

The company needs to drop its fixed reservable rate on all cars by 10% and its fixed on standby rate on all cars by 5% to be competitive.

b) Express these reductions in a matrix R

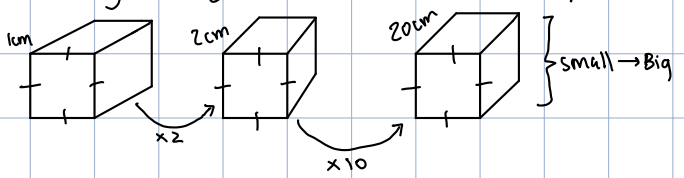
$R = \begin{bmatrix}0.90 & 0\\0 & 0.95\end{bmatrix}$

100 – 0.10
100 – 0.05

c) Find Matrix N showing the new fixed rate

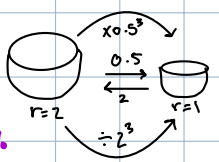
$N = \begin{bmatrix}18 & 18\\21 & 18\\23 & 21\\27 & 23\end{bmatrix} \times \begin{bmatrix}0.90 & 0\\0 & 0.95\end{bmatrix} = \begin{bmatrix}16.2 & 17.1\\18.9 & 17.1\\20.7 & 19.95\\24.3 & 21.85\end{bmatrix}$

Similarity: x : y = original lengths : final lengths

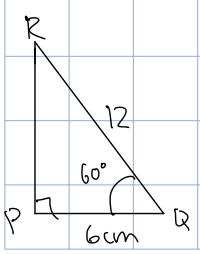


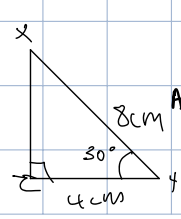
$V = 1\times1\times1 = 1cm^3$ (×2) $V = 2\times2\times2 = 8cm^3$ $V = 20\times20\times20 = 8000cm^3$

$SA = 1\times1\times6 = 6cm^2$ $SA = 2\times2\times6 = 24cm^2$ (×10²) $SA = 20\times20\times6 = 2400cm^2$



can be ÷ by full number if original Bigger





L = 12 (8 × 1.5)
R = 1.5 (6 ÷ 4

APQR: AZYX = 6 : 4 (÷2)
= 3 : 2 (÷2)
$= 3^2 : 2^2$
= 9 : 4