INTERNATIONAL MATHEMATICS

0607 P4

2020 - 2025

QUESTIONS + ANSWERS

CH1	**Number**	Page 1
CH2	**Algebra**	Page 69
CH3	**Functions**	Page 154
CH4	**Coordinate Geometry**	Page 249
CH5	**Geometry**	Page 278
CH6	**Vectors & Transformation**	Page 328
CH7	**Mensuration**	Page 381
CH8	**Trigonometry**	Page 431
CH9	**Sets**	Page 495
CH10	**Probability**	Page 519
CH11	**Statistics**	Page 566

1 - (0607/41_Summer_2020_Q7) ANSWER

(a) Louis invests $500 at a rate of 2.5% per year simple interest.

Calculate the total amount of interest at the end of 8 years.

$ ..... [2]

(b) Martha invests $500 at a rate of 2.4% per year compound interest.

Calculate the total amount of interest at the end of 8 years.

$ ..... [4]

(c) Naomi invests an amount of money at a rate of 2.1% per year compound interest.

Find the number of complete years it takes for the value of Naomi's investment to double.

..... [4]

(d) Oscar invests an amount of money at a rate of r% per year compound interest.
At the end of 31 years the value of Oscar's investment is 2.5 times greater than the original amount of money.

Find the value of r.

$r =$ ..... [3]

2 - (0607/42_Summer_2020_Q6) ANSWER

Herman bought a motorbike on 1 January 2014.
By 1 January 2015 the value of the motorbike had reduced by 16%.
By 1 January 2016 the value of the motorbike had reduced by 12% of the value on 1 January 2015.
The value of the motorbike on 1 January 2016 was $7392.

(a) Find how much Herman paid for the motorbike.

$ ..... [3]

(b) From 2016, the value of the motorbike reduced by 8% each year.

Calculate the number of complete years it will take for the value of the motorbike to decrease from $7392 to $5000.

..... [4]

3 - (0607/43_Summer_2020_Q3) ANSWER

(a) Riaz invests $5000 at a rate of 2.5% per year simple interest.

(i) Calculate the value of the investment at the end of 4 years.

$ ..... [3]

(ii) Calculate the number of complete years it will take for the value of the investment to be $6500.

..... [2]

(b) Yasmin invests $5000 at a rate of 2% per year compound interest.

(i) Calculate the value of Yasmin's investment at the end of 4 years.

$ ..... [3]

(ii) Calculate the number of complete years it will take for the value of Yasmin's investment to first be worth more than $6500.

..... [4]

4 - (0607/41_Winter_2020_Q2) ANSWER

(a) Write the number 25.0467

(i) correct to 1 decimal place,

..... [1]

(ii) correct to 3 significant figures,

..... [1]

(iii) correct to the nearest 10,

..... [1]

(iv) correct to the nearest 0.001,

..... [1]

(v) in standard form.

..... [1]

(b) Change

(i) 20 cm into metres,

..... m [1]

(ii) 20 m^2 into square centimetres,

..... cm^2 [1]

(iii) 18 km/h into metres per second.

.....m/s [2]

5 - (0607/42_Winter_2020_Q1) ANSWER

Asif buys a one-year old car.
He pays $19 975 which is 15% less than its price when it was new.

(a) Calculate the price when it was new.

$ ..... [2]

(b) Option 1 Pay 10% of the $19 975 and then pay $345 per month for 5 years.

Option 2 Borrow $19 975 and pay this back at the end of 5 years at a rate of 2.5% per year compound interest.

Asif can pay for the car using Option 1 or Option 2.

(i) Using Option 1, find how much Asif would pay in total for the car.

$ ..... [3]

(ii) By how much is Option 2 cheaper than Option 1?

$ ..... [4]

6 - (0607/42_Winter_2020_Q5) ANSWER

Naomi flies non-stop from London, England, to Perth, Australia.
The flight takes 16 hours 45 minutes.
The distance is 14 498 km.

(a) Find the average speed of the plane in km/h.

..... km/h [2]

(b) The plane leaves London at 13 15.
The time in Perth is 8 hours ahead of the time in London.

Find the time in Perth when the plane lands.

..... [3]

(c) The cost, in pounds (£), of the flight is £827.75 .
The exchange rate is 1 Australian dollar = £0.55 .

Calculate the cost of the flight in Australian dollars.

..... Australian dollars [2]

7 - (0607/42_Winter_2020_Q10) ANSWER

y is inversely proportional to the square root of x.

When $x = 25$, $y = 4$.

(a) Find y in terms of x.

$y =$ ..... [2]

(b) Find y when $x = 0.25$.

$y =$ ..... [1]

(c) Find x when $y = 5$.

$x =$ ..... [2]

(d) z is proportional to $y+2$.
When $x = 4$, $z = 84$.

Find z in terms of x.

$z =$ ..... [3]

8 - (0607/43_Winter_2020_Q1) ANSWER

Adam and Brenda share \$560 in the ratio Adam : Brenda = 4 : 3.

(a) Show that Adam receives \$320.

[1]

(b) Adam spends 15% of his $320 on some software.

Calculate how much Adam spends on this software.

$ ..... [2]

(c) In a sale, Brenda buys a computer for $179.40 .
This is 8% less than the original price.

Calculate the original price of the computer.

$ ..... [2]

(d) Adam spends a further $29.60 on a train ticket.
Adam and Brenda then work out how much money each of them has left.

Show that Adam has 4 times as much left as Brenda.

[3]

9 - (0607/43_Winter_2020_Q5) ANSWER

(a) Carla invests $600 at a rate of 1.8% per year compound interest.

Calculate the value of Carla's investment at the end of 7 years.

$ ..... [3]

(b) Dominic wants to invest his money so that it will double its value in 17 years.

Find the lowest possible rate of compound interest per year that will give Dominic this result.
Give your answer correct to 1 decimal place.

..... % [4]

(c) Each year, the population of a village is decreasing at a rate of 4% of its value at the beginning of that year.
The population is now 2120.

Find the number of complete years since the population was last greater than 2700.

..... [4]

1 - (0607/41_Summer_2020_Q7) QUESTION

(a)	100	**2**	**M1** for $\frac{500\times2.5\times8}{100}$ oe
(b)	104 or 104.4 to 104.5	**4**	**B3** for 604 or 604.4 to 604.5 or **M2** for $500\times\left(1+\frac{2.4}{100}\right)^{8}$ oe or **M1** for $500\times\left(1+\frac{2.4}{100}\right)^{n}$ with $n>1$ oe
(c)	34	**4**	**M3** for $[n=]\frac{\log 2}{\log(1.021)}$ oe or at least two trials with $n>30$ or graph leading to solution oe (implied by 33.4 or 33.35...) or **M2** for $1.021^{n}=2$ oe or suitable graph e.g. $y=1.021^{x}$ or 3 correct trials or **B1** for 1.021^{n} oe seen
(d)	3[.00] or 2.999...	**3**	**M2** for $\sqrt[31]{2.5}$ oe or sketch of graph leading to answer or **M1** for $(...)^{31}=2.5$ oe or sketch of a relevant graph

2 - (0607/42_Summer_2020_Q6) QUESTION

(a)	10 000	**3**	**M2** for $\frac{7392}{(1-0.16)(1-0.12)}$ oe or **M1** for $\div(1-0.16)$ or $\div(1-0.12)$ oe or **M1** for 88% is 'equivalent' to 7392
(b)	5	**4**	**M3** for $[k=]\frac{\log\frac{5000}{7392}}{\log 0.92}$ oe or correct trials as far as 4 and 5 or **M2** for $0.92^{k}=\frac{5000}{7392}$ oe or at least 3 correct trials or **M1** for $7392\times0.92^{k}=5000$ oe

3 - (0607/43_Summer_2020_Q3) QUESTION

(a)(i)	5500	**3**	**M2** for $5000+\frac{5000\times2.5\times4}{100}$ oe or **M1** for $\frac{5000\times2.5\times4}{100}$ oe
(a)(i)	12	**2**	**M1** for $\frac{5000\times2.5\times n}{100}=6500-5000$ oe
(b)(i)	5412.16	**3**	**M2** for $5000\times\left(1+\frac{2}{100}\right)^4$ or **M1** for $5000\times\left(1+\frac{2}{100}\right)^n$, $n>1$
(b)(ii)	14	**4**	**M3** for $[n=]\ \frac{\log\left(\frac{6500}{5000}\right)}{\log 2}$ soi by 13.2 or 13.24 to 13.25 or answer 13 or correct trials as far as 13 and 14 or **M2** for $1.02^n=\left(\frac{6500}{5000}\right)$ or at least 3 correct trials or suitable graph or **M1** for $5000\times1.02^n=6500$ soi.

4 - (0607/41_Winter_2020_Q2) QUESTION

(a)(i)	25.0 cao	**1**	
(a)(ii)	25.0 cao	**1**	
(a)(iii)	30	**1**	
(a)(iv)	25.047	**1**	
(a)(v)	$2.50467\times10^{[1]}$	**1**	
(b)(i)	0.2[0] oe	**1**	
(b)(ii)	200 000	**1**	
(b)(iii)	5	**2**	**M1** for $\times1000\div3600$

5 - (0607/42_Winter_2020_Q1) QUESTION

(a)	23500	**2**	**M1** for $x \times \frac{100-15}{100} = 19975$ oe or better
(b)(i)	22697.5[0] final answer	**3**	**M1** for $19975 \times \frac{10}{100}$ soi by 1997.5 **M1** for 12×345 [× 5]
(b)(ii)	97.62	**4**	**M2** for $19975\left(1+\frac{25}{100}\right)^5$ or **M1** for $19975\left(1+\frac{25}{100}\right)^n$, $n > 1$ **M1** for *their* 22 697.5 – *their* 22 599.88

6 - (0607/42_Winter_2020_Q5) QUESTION

(a)	866 or 865.5 to 865.6	**2**	**M1** for 14 498 ÷ 16.75
(b)	14 00 or 2 pm	**3**	**B1** for 29h 60min or 30 h **B1** for 06 00 OR **B1** for 21 15 oe **B1** for 38h or 37h 60min OR **M1** for 13 15 + 8 + 16 45 or 13 15 + 16 45 + 8 **M1** for a correct conversion to 24 hour clock
(c)	1505 cao	**2**	**M1** for 827.75 ÷ 0.55

7 - (0607/42_Winter_2020_Q10)

(a)	$[y =] \frac{20}{\sqrt{x}}$ oe	**2**	**M1** for $\frac{k}{\sqrt{x}}$ oe
(b)	40	**1**	**FT** incorrect k only
(c)	16	**2**	**M1** *their* $20 = 5\sqrt{x}$ or better
(d)	$[z =]7\left(\frac{20}{\sqrt{x}}+2\right)$ oe final answer	**3**	**M2** for $z = K\left(\frac{their\,20}{\sqrt{x}}+2\right)$ or for $84 = K\left(\frac{their\,20}{\sqrt{4}}+2\right)$ oe or **M1** for $z = K(y + 2)$ oe

8 - (0607/43_Winter_2020_Q1)

(a)	$\frac{560}{7}\times 4$ oe	**M1**	
(b)	48	**2**	**M1** for $\frac{15}{100}\times 320$ oe
(c)	195	**2**	**M1** for $x \times \frac{100-8}{100} = 179.40$ oe or better
(d)	320 – *their* 48 – 29.60 = 242.40	**M1**	Clear working to 242.40
	their 240 – 179.40 = 60.60	**M1**	Clear working to 60.60
	$60.60 \times 4 = 242.40$ cao	**A1**	Clear statement using 242.40 and 60.60

9 - (0607/43_Winter_2020_Q5)

(a)	679.81 or 680 or 679.8...	**3**	**M2** for $600\left(1+\frac{1.8}{100}\right)^7$ or **M1** for $600\left(1+\frac{1.8}{100}\right)^k$, $k > 1$
(b)	4.2	**4**	**B3** for 4.16 or 4.161 to 4.162 or **B2** for $\sqrt[17]{2}$ oe or **M1** for $(P) \times (...)^{17} = (2P)$ oe

(c)	6	**4**	**B3** for 5.92 or 5.924... OR **M3** for $n\log\left(1-\frac{4}{100}\right)=\log\left(\frac{2120}{2700}\right)$ oe or correct trials as far as 5 and 6 or good sketch indicating value between 5 and 6 or **M2** for $\left(1-\frac{4}{100}\right)^n=\frac{2120}{2700}$ or at least two trials with $n > 2$ or sketch that could lead to solution e.g. $y=0.96^x$ or **M1** for $2700\left(1-\frac{4}{100}\right)^n=2120$ oe or at least 2 correct trials

10 - (0607/41_Summer_2021_Q4) QUESTION

(a)	39.8 or 39.81 to 39.82	**2**	**M1** for at least 5 correct mid-points soi
(b)	[41], 73, 117, 167, 232, 280, [300]	**1**	
	In parts (c), (d) and (e), marks can only be earned with an increasing curve		
(c)	Correct curve (10, 41) (20, 73) (30, 117) (40, 167) (60, 232) (80, 280) (100, 300)	**3**	**M1** for horizontal plot correct **M1** for at least 6 vertical plots from their table correct
(d)(i)	35 to 38	**1**	
(d)(ii)	35 to 39	**2**	**B1** for [UQ =] 56 to 59 or [LQ =] 20 to 21
(e)	46 to 50	**2**	**B1** for 195 or 105 seen