

IGCSE Cambridge Topical Past Papers

MATHEMATICS 9-1

0980 Paper 4

2020 — 2025

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1 - (0980/42_Summer_2020_Q1)

- (a) (i) Divide \$24 in the ratio 7 : 5.

\$, \$ [2]

- (ii) Write \$24.60 as a fraction of \$2870.
Give your answer in its lowest terms.

..... [2]

- (iii) Write \$1.92 as a percentage of \$1.60 .

..... % [1]

- (b) In a sale the original prices are reduced by 15%.

- (i) Calculate the sale price of a book that has an original price of \$12.

..... [2]

- (ii) Calculate the original price of a jacket that has a sale price of \$38.25 .

..... [2]

- (c) (i) Dean invests \$500 for 10 years at a rate of 1.7% per year simple interest.

Calculate the total interest earned during the 10 years.

..... [2]

- (ii) Ollie invests \$200 at a rate of 0.0035% **per day** compound interest.

Calculate the value of Ollie's investment at the end of 1 year.

[1 year = 365 days.]

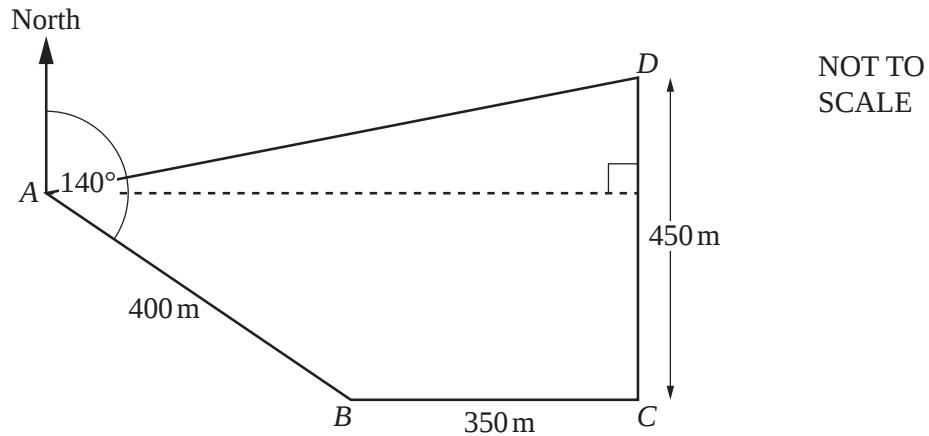
..... [2]

- (iii) Edna invests \$500 at a rate of $r\%$ per year compound interest.
At the end of 6 years, the value of Edna's investment is \$559.78 .

Find the value of r .

$r =$ [3]

2 - (0980/42_Summer_2020_Q5)



The diagram shows a field $ABCD$.
 The bearing of B from A is 140° .
 C is due east of B and D is due north of C .
 $AB = 400$ m, $BC = 350$ m and $CD = 450$ m.

(a) Find the bearing of D from B .

..... [2]

(b) Calculate the distance from D to A .

..... m [6]

(c) Jono runs around the field from A to B , B to C , C to D and D to A .
 He runs at a speed of 3 m/s.

Calculate the total time Jono takes to run around the field.
 Give your answer in minutes and seconds, correct to the nearest second.

..... min s [4]

3 - (0980/41_Winter_2020_Q2)

- (a) A plane has 14 First Class seats, 70 Premium seats and 168 Economy seats.

Find the ratio First Class seats : Premium seats : Economy seats.
Give your answer in its simplest form.

..... : : [2]

- (b) (i) For a morning flight, the costs of tickets are in the ratio

$$\text{First Class : Premium : Economy} = 14 : 6 : 5.$$

The cost of a Premium ticket is \$114.

Calculate the cost of a First Class ticket and the cost of an Economy ticket.

First Class \$

Economy \$ [3]

- (ii) For an afternoon flight, the cost of a Premium ticket is reduced from \$114 to \$96.90 .

Calculate the percentage reduction in the cost of a ticket.

..... % [2]

- (c) When the local time in Athens is 09 00, the local time in Berlin is 08 00.

A plane leaves Athens at 13 15.

It arrives in Berlin at 15 05 local time.

Find the flight time from Athens to Berlin.

..... h min [1]

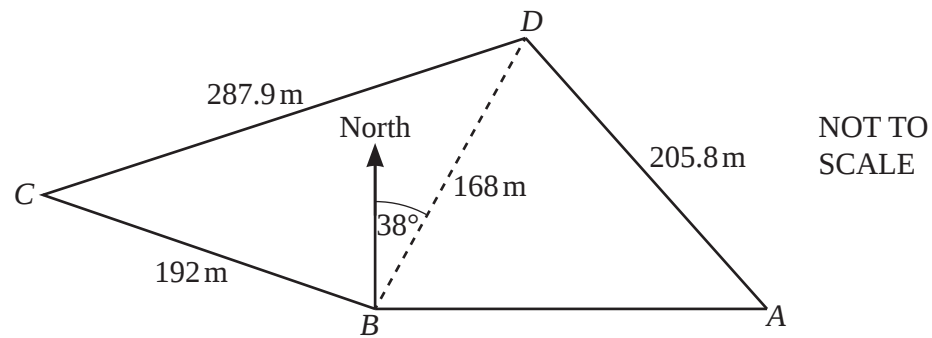
- (i) The distance the plane flies from Athens to Berlin is 1802 km.

Calculate the average speed of the plane.

- (ii) Give your answer in kilometres per hour.

..... km/h [2]

4 - (0980/41_Winter_2020_Q6)



The diagram shows a field, $ABCD$, on horizontal ground.
 $BC = 192$ m, $CD = 287.9$ m, $BD = 168$ m and $AD = 205.8$ m.

- (a) (i) Calculate angle CBD and show that it rounds to 106.0° , correct to 1 decimal place.

[4]

- (ii) The bearing of D from B is 038° .

Find the bearing of C from B .

..... [1]

- (iii) A is **due east** of B .

Calculate the bearing of D from A .

..... [5]

- (b) (i) Calculate the area of triangle BCD .

..... m^2 [2]

- (ii) Tomas buys the triangular part of the field, BCD .
 The cost is \$35 750 per hectare.

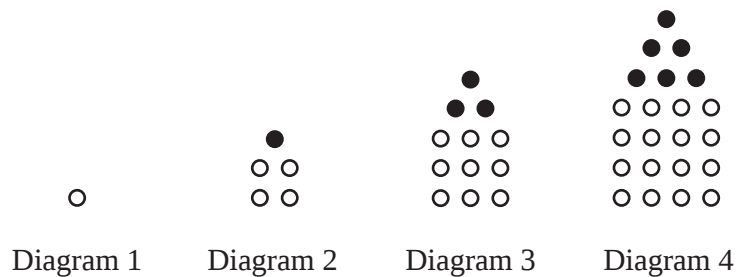
Calculate the amount he pays.

Give your answer correct to the nearest \$100.

[1 hectare = $10\,000\text{m}^2$]

\$ [2]

5 - (0980/41_Winter_2020_Q7)



These are the first four diagrams of a sequence.
The diagrams are made from white dots and black dots.

(a) Complete the table for Diagram 5 and Diagram 6.

Diagram	1	2	3	4	5	6
Number of white dots	1	4	9	16		
Number of black dots	0	1	3	6		
Total number of dots	1	5	12	22		

[2]

(b) Write an expression, in terms of n , for the number of white dots in Diagram n .

..... [1]

(c) The expression for the total number of dots in Diagram n is $\frac{1}{2}(3n^2 - n)$.

(i) Find the total number of dots in Diagram 8.

..... [1]

(ii) Find an expression for the number of black dots in Diagram n .
Give your answer in its simplest form.

..... [2]

(d) T is the total number of dots used to make **all** of the first n diagrams.

$$T = an^3 + bn^2$$

Find the value of a and the value of b .
You must show all your working.

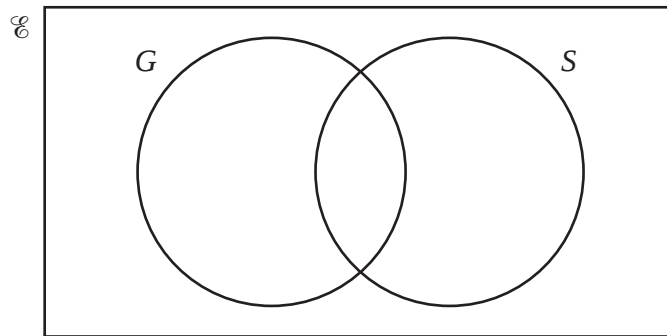
$a =$

$b =$ [5]

6 - (0980/41_Winter_2020_Q9)

- (a) There are 32 students in a class.

5 do not study any languages.
 15 study German (G).
 18 study Spanish (S).



- (i) Complete the Venn diagram to show this information. [2]

- (ii) A student is chosen at random.

Find the probability that the student studies Spanish but not German.

..... [1]

- (iii) A student who studies German is chosen at random.

Find the probability that this student also studies Spanish.

..... [1]

- (b) A bag contains 54 red marbles and some blue marbles.
 36% of the marbles in the bag are red.

Find the number of blue marbles in the bag.

..... [2]

- (c) Another bag contains 15 red beads and 10 yellow beads.
 Ariana picks a bead at random, records its colour and replaces it in the bag.
 She then picks another bead at random.

- (i) Find the probability that she picks two red beads.

..... [2]

- (ii) Find the probability that she does not pick two red beads.

..... [1]

- (d) A box contains 15 red pencils, 8 yellow pencils and 2 green pencils.
 Two pencils are picked at random without replacement.

Find the probability that at least one pencil is red.

..... [3]

7 - (0980/42_Summer_2021_Q1)

- (a) A 2.5-litre tin of paint costs \$13.50 .
In a sale, the cost is reduced by 14%.

Work out the sale price of this tin of paint.

..... [2]

Work out the cost of buying 42.5 litres of paint at this sale price.

..... [2]

Henri buys some paint in the ratio red paint : white paint : green paint = 2 : 8 : 5.

Find the percentage of this paint that is white.

..... % [1]

Henri buys a total of 22.5 litres of paint.

Find the number of litres of green paint he buys.

..... litres [2]

Maria paints a rectangular wall.

The length of the wall is 20.5m and the height is 2.4m, both correct to 1 decimal place.

One litre of paint covers an area of exactly 10m^2 .

Calculate the smallest number of 2.5-litre tins of paint she will need to be sure all the wall is painted.

Show all your working.

..... [4]

8 - (0980/42_Summer_2021_Q3)

(a) Simplify, giving your answer as a single power of 7.

(i) $7^5 \times 7^6$

..... [1]

(ii) $7^{15} \div 7^5$

..... [1]

(iii) $42 + 7$

..... [1]

(b) Simplify.

$(5x^2 \times 2xy^4)^3$

..... [3]

(c) $P = 2^5 \times 3^3 \times 7$ $Q = 540$

(i) Find the highest common factor (HCF) of P and Q .

..... [2]

(ii) Find the lowest common multiple (LCM) of P and Q .

..... [2]

(iii) $P \times R$ is a cube number, where R is an integer.Find the smallest possible value of R .

..... [2]

(d) Factorise the following completely.

(i) $x^2 - 3x - 28$

..... [2]

(ii) $7(a+2b)^2 + 4a(a+2b)$

..... [2]

(e) $3^{2x-1} = \frac{1}{9^x} \times 3^{2y-x}$

Find an expression for y in terms of x . $y =$ [4]

9 - (0980/42_Summer_2021_Q10)

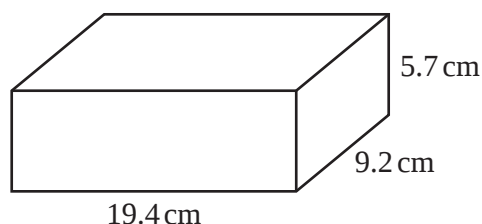
The table shows four sequences A , B , C and D .

Sequence	1st term	2nd term	3rd term	4th term	5th term		n th term
A	1	8	27	64			
B	5	11	17	23			
C	0.25	0.5	1	2	4		
D	4.75	10.5	16	21			

Complete the table.

[9]

10 - (0980/41_Winter_2021_Q1)

(a)NOT TO
SCALE

The diagram shows a brick in the shape of a cuboid.

(i) Calculate the total surface area of the brick.

..... cm^2 [3]

(ii) The density of the brick is 1.9 g/cm^3 .

Work out the mass of the brick.

Give your answer in kilograms.

[Density = mass $\div$ volume]

..... kg [3]

(b) 9000 bricks are needed to build a house.
200 bricks cost \$175.

Work out the cost of the bricks needed to build 5 houses.

..... [3]

(c) Saskia builds a wall using 1500 bricks.
She can build at the rate of 40 bricks each hour.
She works for 9 hours each day.
Saskia starts work on 6 July and works every day until the wall is completed.

Find the date when she completes the wall.

..... [3]

(d) Rafa has a cylindrical tank.
The cylinder has a height of 105 cm and a diameter of 45 cm.

Calculate the capacity of the tank in litres.

..... litres [3]

11 - (0980/41_Winter_2021_Q2)

Bob, Chao and Mei take part in a run for charity.

(a) Their times to complete the run are in the ratio Bob : Chao : Mei = 4 : 5 : 7.

(i) Find Chao's time as a percentage of Mei's time.

..... % [1]

(ii) Bob's time for the run is 55 minutes 40 seconds.

Find Mei's time for the run.

Give your answer in minutes and seconds.

..... min s [3]

(b) Chao collects \$47.50 for charity.

(i) Bob collects 28% more than Chao.

Find the amount Bob collects.

\$..... [2]

(ii) Chao collects 60% less than Mei.

Find how much more money Mei collects than Chao.

\$..... [3]

(c) When running, Chao has a stride length of 70 cm, correct to the nearest 5 cm.
Chao runs a distance of 11.2 km, correct to the nearest 0.1 km.

Work out the minimum number of strides that Chao could take to complete this distance.

..... [4]

(d) In 2015, a charity raised a total of \$1.6 million.
After 2015, this amount increased exponentially by 2.4% each year for the next 5 years.

Work out the amount raised by the charity in 2020.

\$..... million [2]

12 - (0980/42_Summer_2022_Q1)

- (a) Find the lowest common multiple (LCM) of 30 and 75.

..... [2]

- (b) Share \$608 in the ratio 4 : 5 : 7.

.....

.....

..... [3]

- (c) Work out $\frac{6.39 \times 10^4}{2.45 \times 10^6}$.

Give your answer in standard form.

..... [2]

- (d) Write $0.\dot{2}\dot{7}$ as a fraction.

..... [1]

- (e) A stone has volume 45 cm^3 and mass 126 g.
Find the density of the stone, giving the units of your answer.

[Density = mass $\div$ volume]

..... [2]

13 - (0980/42_Summer_2022_Q6)

- (a) At a festival, 380 people out of 500 people questioned say that they are camping.
There are 55 300 people at the festival.

Calculate an estimate of the total number of people camping at the festival.

..... [2]

- (b) 12 friends travel to the festival.
5 travel by car, 4 travel by bus and 3 travel by train.
Two people are chosen at random from the 12 friends.

Calculate the probability that they travel by different types of transport.

..... [4]

- (c) Arno buys a student ticket for \$43.68 .
This is a saving of 16% on the full price of a ticket.

Calculate the full price of a ticket.

..... [2]

- (d) At a football match, there are 29 800 people, correct to the nearest 100.

- (i) At the end of the football match, the people leave at a rate of 400 people per minute, correct to the nearest 50 people.

Calculate the lower bound for the number of minutes it takes for all the people to leave.

..... min [3]

- (ii) At a cricket match there are 27 500 people, correct to the nearest 100.
Calculate the upper bound for the difference between the number of people at the football match and at the cricket match.

..... [2]

14 - (0980/41_Winter_2022_Q1)

(a) Calculate the volume of

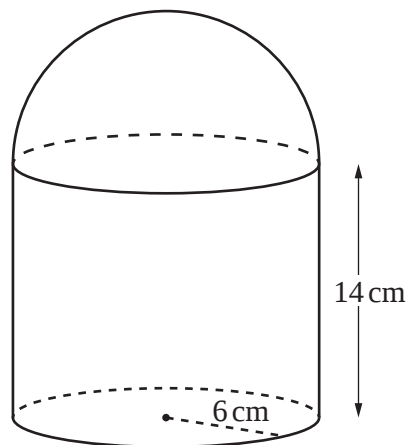
(i) a solid cylinder with radius 6 cm and height 14 cm,

..... cm^3 [2]

(ii) a solid hemisphere with radius 6 cm.

[The volume, V , of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]..... cm^3 [2]

(b)

NOT TO
SCALE

The cylinder and hemisphere in **part (a)** are joined to form the solid in the diagram.
The solid is made of steel and 1 cm^3 of steel has a mass of 7.85 g.

(i) Show that 1 cm^3 of steel has a mass of 0.007 85 kg.

[1]

(ii) Calculate the total mass of the solid.

..... kg [2]

(c) 2000 cm^3 of iron is melted down and some of it is used to make 50 spheres with radius 2 cm.

- (i) Calculate the percentage of iron that is left over.
[The volume, V , of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

..... % [3]

- (ii) The iron left over is then made into a cube.

Calculate the length of an edge of the cube.

..... cm [1]

- (d) A solid cone has radius $3R$ cm and slant height $9R$ cm.

A solid cylinder has radius x cm and height $7x$ cm.

The **total** surface area of the cone is equal to the **total** surface area of the cylinder.

Given that $R = kx$, find the value of k .

[The curved surface area, A , of a cone with radius r and slant height l is $A = \pi rl$.]

$k =$ [4]

15 - (0980/41_Winter_2022_Q2)

(a) Write**(i)** 2994.99 correct to the nearest 10,

..... [1]

(ii) 0.983 correct to 1 decimal place,

..... [1]

(iii) 2090 correct to 2 significant figures.

..... [1]

(b) Write down a prime number between 90 and 100.

..... [1]

(c) Write 2^{-6} as a fraction.

..... [1]

(d) Write 0.007 01 in standard form.

..... [1]

(e) Simplify $1.5 \times 10^x + 1.5 \times 10^{x-1}$ giving your answer in standard form.

..... [2]

(f) Write $0.\dot{3}\dot{7}$ as a fraction.
You must show all your working.

..... [2]

1 - (0980/42_Summer_2020_Q1)

(a)(i)	14, 10	2	M1 for $24 \div (7 + 5)$
(a)(ii)	$\frac{3}{350}$	2	B1 for correct fraction not in lowest terms
(a)(iii)	120	1	
(b)(i)	10.2[0]	2	M1 for $\frac{15}{100} \times 12$ oe or better
(b)(ii)	45	2	M1 for $\frac{38.25}{1 - \frac{15}{100}}$ oe
(c)(i)	85	2	M1 for $\frac{500 \times 1.7 \times 10}{100}$ oe
(c)(ii)	203 or 202.5 to 202.6	2	M1 for $200 \times \left(1 + \frac{0.0035}{100}\right)^{365}$
(c)(iii)	1.9	3	M2 for $\sqrt[6]{\frac{559.78}{500}}$ or M1 for $500 \left(1 + \frac{r}{100}\right)^6 = 559.78$

2 - (0980/42_Summer_2020_Q5)

(a)	[0]38 or [0]37.9 or [0]37.87...	2	M1 for $\tan = \frac{350}{450}$ oe If 0 scored, SC1 for answer [0]52 or [0]52.1 or [0]52.12 to [0]52.13
(b)	624 or 623.8 to 623.9	6	M2 for $450 - 400 \sin 50$ or M1 for $\sin 50 = \frac{\dots}{400}$ M2 for $350 + 400 \cos 50$ or M1 for $\cos 50 = \frac{\dots}{400}$ M1 for $(\text{their } (450 - 400 \sin 50))^2 + (\text{their } (350 + 400 \cos 50))^2$
(c)	10 min 8 s	4	B3 for 10.1 or 10.13... or M2 for $(400 + 350 + 450 + \text{their } DA) \div 3 [\div 60]$ oe or M1 for any distance $\div 3$ M1 for rounding <i>their</i> minutes into minutes and seconds to nearest second if clearly seen

3 - (0980/41_Winter_2020_Q2)

(a)	1 : 5 : 12	2	M1 for 2 : 10 : 24 or 7 : 35 : 84 or $\frac{1}{18} : \frac{5}{18} : \frac{12}{18}$
(b)(i)	266 and 95	3	B2 for 266 or 95 or 266 and 95 reversed or M1 for $\frac{114}{6}$
(b)(ii)	15	2	M1 for $\frac{114 - 96.9}{114} [\times 100]$ oe or $\frac{96.9}{114} \times 100$
(c)(i)	2h 50min	1	
(c)(ii)	636	2	M1 for $1802 \div \text{their } 2\text{h } 50\text{min}$

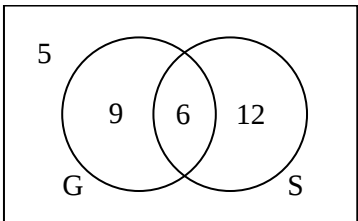
4 - (0980/41_Winter_2020_Q6)

(a)(i)	106.01 to 106.02	4	M2 for [cos[$\angle CBD$] =] $\frac{192^2 + 168^2 - 287.9^2}{2 \times 192 \times 168}$ oe or M1 for the implicit form A1 for -0.276 to -0.275
(a)(ii)	292.0 or 291.98 to 291.99	1	
(a)(iii)	310.0 or 310.03 to 310.04	5	M2 for [sin A =] $\frac{168 \times \sin(90 - 38)}{205.8}$ or M1 for $\frac{\sin A}{168} = \frac{\sin(90 - 38)}{205.8}$ A1 for [A =] 40.0 or 40.03 to 40.04 M1 dep for 270 + <i>their</i> angle DAB oe
(b)(i)	15 500 or 15 501 to 15 503. ...	2	M1 for $0.5 \times 192 \times 168 \times \sin(106)$ oe
(b)(ii)	55 400	2	FT $3.575 \times \text{their } (b)(i)$ oe rounded to nearest 100 M1 for figs 35 75 $\times$ figs <i>their</i> (b)(i) or figs 554 or figs 5541 to figs 5543

5 - (0980/41_Winter_2020_Q7)

(a)	25 36 10 15 35 51	2	B1 for 3, 4 or 5 correct
(b)	n^2	1	
(c)(i)	92	1	
(c)(ii)	$\frac{1}{2}(n^2 - n)$ oe	2	M1 for $\frac{1}{2}(3n^2 - n) - n^2$ oe or for final quadratic answer with $\frac{1}{2}n^2$ oe or $-\frac{1}{2}n^2$ oe but not both
(d)	$a = \frac{1}{2}, b = \frac{1}{2}$	5	B2 for 2 correct equations eg $a + b = 1, 8a + 4b = 6$ or B1 for 1 correct equation B2 for one correct value or M1 (dep on at least B1) for correctly eliminating one variable from two linear equations in a and b OR B2 for $a = \frac{1}{2}$ or B1 for $6a = 3$ or for 3 rd difference = 3 B2 for $b = \frac{1}{2}$ or M1 for substituting <i>their</i> a into a correct equation of first differences

6 - (0980/41_Winter_2020_Q9)

(a)(i)		2	B1 for two correct values Or B1 5 outside and total in G = 15 and total in S = 18
(a)(ii)	$\frac{3}{8}$ oe	1	FT $\frac{\text{their } 12}{32}$
(a)(iii)	$\frac{2}{5}$ oe	1	FT $\frac{\text{their } 6}{15}$
(b)	96	2	M1 for $\frac{36}{64} = \frac{54}{x}$ oe or $36 = \frac{54}{(54+b)} \times 100$ oe If 0 scored SC1 for answer 150
(c)(i)	$\frac{9}{25}$ oe	2	M1 for $\frac{15}{25} \times \frac{15}{25}$ oe
(c)(ii)	$\frac{16}{25}$ oe	1	FT 1 – their (c)(i)
(d)	$\frac{17}{20}$ oe	3	M2 for $1 - \frac{10}{25} \times \frac{9}{24}$ oe or for $\frac{15}{25} \times \frac{14}{24} + \frac{15}{25} \times \frac{8}{24} + \frac{15}{25} \times \frac{2}{24} + \frac{8}{25} \times \frac{15}{24}$ $+ \frac{2}{25} \times \frac{15}{24}$ oe or M1 for one correct relevant product

7 - (0980/42_Summer_2021_Q1)

(a)(i)	11.61 final answer	2	M1 for $13.5[0] \times \left(1 - \frac{14}{100}\right)$ oe or B1 for 1.89
(a)(ii)	197.37 final answer	2	FT $17 \times$ <i>their</i> (a)(i) exact or correct to nearest cent M1 for $42.5 \div 2.5$
(b)(i)	53.3 or 53.33...	1	
(b)(ii)	7.5	2	M1 for $22.5 \div (2 + 8 + 5)$ oe soi
(c)	20.55×2.45 oe	M2	M1 for $20.5 + 0.05$ oe seen or $2.4 + 0.05$ oe seen If 0 scored, SC1 here for 20.45×2.35 oe
	3 nfww	A2	M1 for <i>their</i> area $\div 10 \div 2.5$ oe

8 - (0980/42_Summer_2021_Q3)

(a)(i)	7^{11} cao	1	
(a)(ii)	7^{10} cao	1	
(a)(iii)	7^2 cao	1	If answers 11, 10 and 2 in (a) then allow SC1 in this part
(b)	$1000x^9y^{12}$ final answer	3	B2 for correct answer seen or answer of the form $1000x^9y^k$ or $1000x^ky^{12}$ or kx^9y^{12} or B1 for answer with one correct element in product or $(10x^3y^4)^{[3]}$ seen
(c)(i)	108	2	M1 for $[540 =] 2^2 [\times] 3^3 [\times] 5$ or B1 for 108 oe not in prime factor form e.g. $2^2 \times 3 \times 9$
(c)(ii)	30 240	2	M1 for $(540 \times 2^5 \times 3^3 \times 7) \div$ <i>their</i> (c)(i) oe or B1 for answer 30 240 oe not in prime factor form e.g. $2^5 \times 3^3 \times 35$
(c)(iii)	98	2	B1 for 592 704 seen or $2^6 \times 3^3 \times 7^3$ seen or 2×7^2 oe seen
(d)(i)	$(x - 7)(x + 4)$ final answer	2	M1 for $x(x - 7) + 4(x - 7)$ or $x(x + 4) - 7(x + 4)$ or better or for $(x + a)(x + b)$ where $ab = -28$ or $a + b = -3$
(d)(ii)	$(a + 2b)(11a + 14b)$ final answer	2	M1 for $(a + 2b)(7(a + 2b) + 4a)$ or $(a + pb)(11a + qb)$ where $pq = 28$ or $11p + q = 36$ If 0 scored, SC1 for $a + 2b(11a + 14b)$
(e)	$[y =] \frac{5x - 1}{2}$ oe final answer	4	B2 for $2x - 1 = -2x + 2y - x$ oe or B1 for $9^x = 3^{2x}$ or better M1dep for correct rearrangement of <i>their</i> 5 term 'linear' equation in y and x to make y the subject

9 - (0980/42_Summer_2021_Q10)

125	n^3 oe final ans	B2	B1 for 125 B1 for n^3
29	$6n - 1$ oe final ans	B3	B1 for 29 B2 for $6n - 1$ oe or B1 for $6n + k$ or $an - 1$ ($a \neq 0$)
	2^{n-3} oe final ans	B2	B1 for $2^{n[+k]}$ oe
25	$6n - 1 - 2^{n-3}$ oe final ans OR 25.25 $-\frac{1}{24}n^3 + \frac{1}{8}n^2 + \frac{17}{3}n - 1$ oe final ans	B2	FT their 29 - 4 and their $6n - 1$ - their 2^{n-3} B1FT for each OR B1 for each

10 - (0980/41_Winter_2021_Q1)

(a)(i)	683	3	M2 for $[2]((19.4 \times 9.2) + (5.7 \times 9.2) + (19.4 \times 5.7))$ oe or M1 for one of 19.4×9.2 or 5.7×9.2 or 19.4×5.7
(a)(ii)	1.93[0] or 1.932 to 1.933	3	M2 for $19.4 \times 9.2 \times 5.7 \times 1.9$ or M1 for $19.4 \times 9.2 \times 5.7$
(b)	39 375	3	M2 for $9000 \div 200 \times 175 \times 5$ or M1 for $9000 \div 200$ soi or for $\frac{175}{200}$ soi
(c)	10 th July	3	B2 for 4.1 to 4.2 or $4\frac{1}{6}$ or 4 days 1.5 hours Or M2 for answer 9 th July or 11 th July or M1 for $1500 \div (9 \times 40)$
(d)	167 or 166.9 to 167.0...	3	B2 for answer with figs 167 or figs 1669 to 1670.. or M1 for $\pi \times 22.5^2 \times 105$ oe If 0 scored SC1 for answer 668 or 667.9 to 668.1

11 - (0980/41_Winter_2021_Q2)

(a)(i)	71.4 or 71.42 to 71.43	1	
(a)(ii)	97 [min] 25 [s]	3	B2 for 13 min 55 sec seen or 97.4 or 97.41 to 97.42 seen or 5845 seen OR M2 for $55.66... \div 4 \times 7$ oe or $3340 \div 4 \times 7$ oe or for $7/4 \times 55 + 7/4 \times 40$ oe or M1 for 55 min 40 sec $\div 4$ oe or M1 for total time $\div 16$ soi
(b)(i)	60.8[0]	2	M1 for $47.5 \times \left(1 + \frac{28}{100}\right)$ oe or B1 for 13.3[0]
(b)(ii)	71.25	3	B2 for 118.75 Or M2 for $47.50 \div \left(1 - \frac{60}{100}\right) - 47.50$ or M1 for $x \times \left(1 - \frac{60}{100}\right) = 47.50$ oe or better
(c)	15 380	4	M3 for $(1\,120\,000 - 5000) \div (70 + 2.5)$ oe or B2 for answer figs 15 379 to figs 15 380 or M2 for $(1\,120\,000 \pm 5000) \div (70 \pm 2.5)$ oe or M1 for one of figs 675, 725, 1115, 1125 seen
(d)	1.8[0] or 1.801 to 1.802 [million] nfw	2	M1 for figs $16 \times \left(1 + \frac{2.4}{100}\right)^5$ oe

12 - (0980/42_Summer_2022_Q1)

(a)	150	2	B1 for answer 150k or M1 for prime factors of 30 or 75 seen or a list of multiples of both 30 and 75 with at least 3 of each or for $\frac{30 \times 75}{15}$ oe or for answer $2 \times 3 \times 5^2$
(b)	152 190 266	3	Accept in any order B2 for two correct answers or M1 for $\frac{608}{4+5+7} \times k$ oe where $k=1, 4, 5, 7$
(c)	2.61×10^{-2} 2.61×10^{-2} or $2.608... \times 10^{-2}$	2	B1 for figs 2608 or 261 seen If 0 scored, SC1 for answer $2.6[0] \times 10^{-2}$ without more accurate value in standard form seen
(d)	$\frac{27}{99}$ oe fraction	1	
(e)	2.8	1	
	g/cm^3 or g cm^{-3}	1	

13 - (0980/42_Summer_2022_Q6)

(a)	42 028	2	M1 for $\frac{380}{500}$ oe soi isw
(b)	$\frac{47}{66}$ oe	4	0.712[1...] M3 for $2\left(\frac{5}{12} \times \frac{4}{11}\right) + 2\left(\frac{4}{12} \times \frac{3}{11}\right) + 2\left(\frac{5}{12} \times \frac{3}{11}\right)$ oe or $1 - \left(\frac{5}{12} \times \frac{4}{11} + \frac{4}{12} \times \frac{3}{11} + \frac{3}{12} \times \frac{2}{11}\right)$ oe or M2 for sum of 3 or more correct product pairs and no incorrect pairs or for $\frac{5}{12} \times \frac{4}{11} + \frac{4}{12} \times \frac{3}{11} + \frac{3}{12} \times \frac{2}{11}$ and no other pairs or M1 for $\frac{k}{12} \times \frac{j}{11}$ seen If 0 scored SC1 for answer $\frac{94}{144}$ oe
(c)	52	2	M1 for $x \times \frac{100-16}{100} = 43.68$ oe or better
(d)(i)	70 or 70.16[5...] or 70.17 or 70.2	3	M2 for $\frac{29750 \text{ to } 29800}{400 + 25}$ or $\frac{29750 \text{ to } 29800}{400 + 24}$ or $\frac{29800 - 50}{400 \text{ to } 425}$ or B1 for 29 750 or 29 850 or 29 849 or 375 or 425 or 424 seen
(d)(ii)	2399 or 2400 nfww	2	B1 for 27 450 or 27 550 or 27 549 or 29 850 or 29 849 seen

14 - (0980/41_Winter_2022_Q1)

(a)(i)	1580 or 1583 to 1584	2	M1 for $\pi \times 6^2 \times 14$
(a)(ii)	452 or 452.3 to 452.4...	2	M1 for $\left[\frac{1}{2}\right] \times \frac{4}{3} \times \pi \times 6^3$
(b)(i)	$7.85 \div 1000 [= 0.00785]$	M1	
(b)(ii)	16[.0] or 15.95 to 15.99	2	FT { <i>their (a)(i)</i> + <i>their (a)(ii)</i> } $\times 0.00785$ evaluated to 3 sig fig or better M1 for (<i>their (a)(i)</i> + <i>their (a)(ii)</i>) $\times 0.00785$
(c)(i)	16.2 or 16.21 to 16.23	3	M2 for $\frac{2000 - 50 \times \frac{4}{3} \times \pi \times 2^3}{2000} [\times 100]$ or for $\frac{50 \times \frac{4}{3} \times \pi \times 2^3}{2000} \times 100$ or M1 for $\frac{50 \times \frac{4}{3} \times \pi \times 2^3}{2000}$
(c)(ii)	6.87 or 6.870 to 6.872	1	FT $\sqrt[3]{2000 - \text{their}\left(50 \times \frac{4}{3} \times \pi \times 2^3\right)}$ evaluated to 3sf or better
(d)	$\frac{2}{3}$ oe	4	M1 for $[\pi](3R)^2 + [\pi]3R \times 9R$ oe M1 for $2[\pi]x^2 + 2[\pi]x \times 7x$ oe M1 for <i>their</i> area of cone = <i>their</i> area of cylinder seen

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