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NORTHBROOKS SECONDARY SCHOOL
End-of-Year Examination 2021
Secondary 3 Express

CANDIDATE NAME			
CLASS		REGISTER NUMBER	

MATHEMATICS 4048/01

Paper 1

4 October 2021

1 hour 30 minutes

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your name, class and register number on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.

Answer **all** the questions.
If working is needed for any question it must be shown with the answer.
Omission of essential working will result in loss of marks.
The use of an approved scientific calculator is expected, where appropriate.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142, unless the question requires the answer in terms of π.

The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 60.

FOR EXAMINER'S USE													
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	/60

DO NOT TURN THE PAGE UNTIL YOU ARE TOLD TO DO SO.

This document consists of 12 printed pages.

Setter: Wendy Lee

Mathematical Formulae

Compound interest

$$\text{Total amount} = P\left(1+\frac{r}{100}\right)^n$$

Mensuration

$$\text{Curved surface area of a cone} = \pi rl$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

$$\text{Volume of a cone} = \frac{1}{3}\pi r^2 h$$

$$\text{Volume of a sphere} = \frac{4}{3}\pi r^3$$

$$\text{Area of triangle } ABC = \frac{1}{2}ab\sin C$$

$$\text{Arc length} = r\theta, \text{ where } \theta \text{ is in radians}$$

$$\text{Sector area} = \frac{1}{2}r^2\theta, \text{ where } \theta \text{ is in radians}$$

Trigonometry

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc\cos A$$

Statistics

$$\text{Mean} = \frac{\sum fx}{\sum f}$$

$$\text{Standard deviation} = \sqrt{\frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f}\right)^2}$$

1 The sine of an angle is 0.8510.
Give two possible values for the angle.

Answer ..... or ..... [2]

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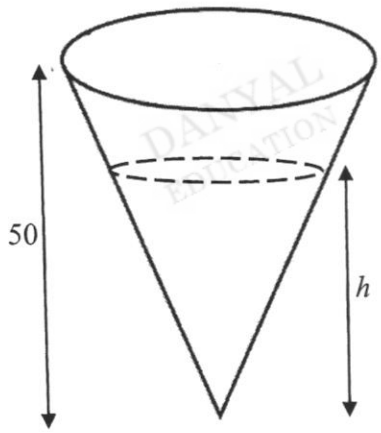
2 The diagram shows a cone of height 50 cm.



The volume of the liquid in the cone is half the volume of the cone.
Calculate the depth, h centimetres, of the liquid.

Answer ..... cm [2]

---

3 Solve $(2x-4)^2 = 81$.

Answer $x =$ ..... or ..... [3]

---

4 Viknes received 12 pieces of \$10 and \$5 notes from his sister.

If the total value of all the notes is less than \$95, what is the maximum number of \$10 notes that he has?

Answer ..... [4]

---

5 Solve the inequalities $0 \leq 3(1-2x) < x+1$.

Answer ..... [3]

---

6 The table shows the population of Singapore and of her neighbouring countries in year 2021.

Countries	Population
Thailand	6.963×10^7
Malaysia	3.195×10^7
Indonesia	2.706×10^8
Singapore	5 902 000

(a) How many more people lived in Thailand than in Singapore?
Give your answer in standard form.

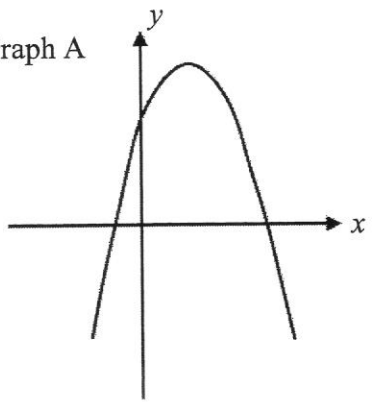
Answer ..... [2]

(b) Calculate the population in Malaysia as a percentage of the population in Indonesia.

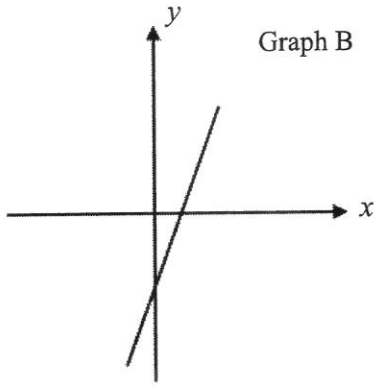
Answer ..... % [2]

7

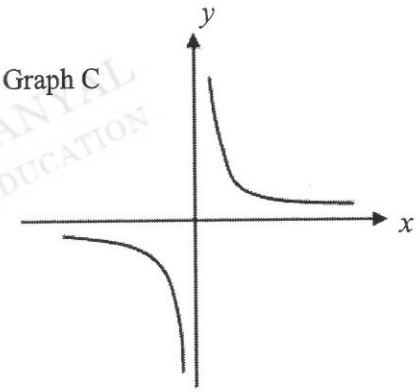
Graph A



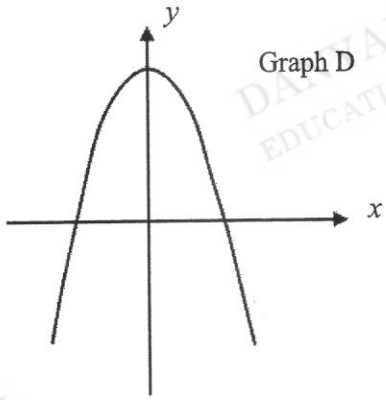
Graph B



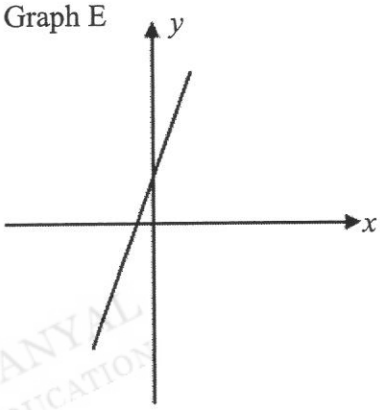
Graph C



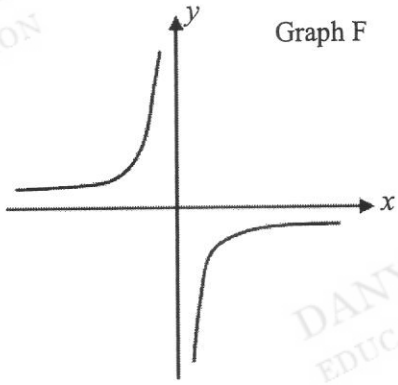
Graph D



Graph E



Graph F



Select the graph that corresponds to each of the following equations.

(a) $y = 2x - 5$.

Answer Graph ..... [1]

(b) $y = -x^2 + 5$.

Answer Graph ..... [1]

(c) $y = \frac{7}{x}$.

Answer Graph ..... [1]

(d) $y = -x^2 + 4x + 3$.

Answer Graph ..... [1]

8 The equation of line l is $6x + 2y = 7$.

A is the point (2, −3) and B is the point (3, 5).

(a) State the gradient of line l.

Answer ..... [1]

(b) Does point A lie on line l ? Show your calculations clearly.

Answer .....

..... [2]

(c) Another line n has the same gradient as line l and passes through point B.

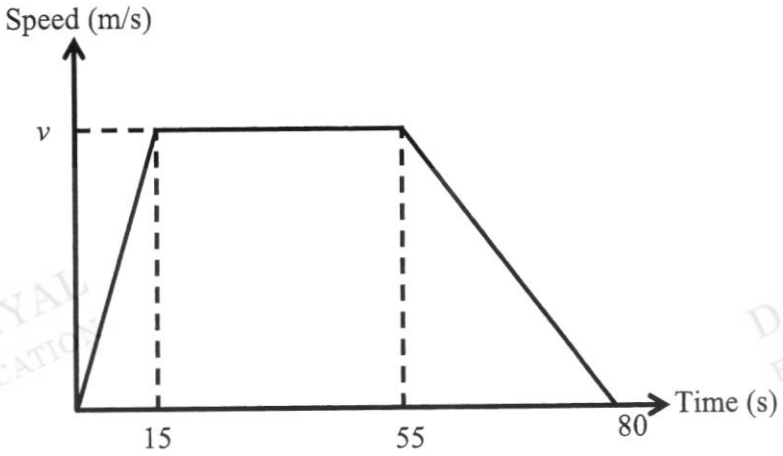
Find the equation of line n.

Answer ..... [3]

(d) Find the length of the line AB.

Answer ..... [2]

9 The diagram shows the speed-time graph of a particle.
It accelerated uniformly from rest at 4.5 m/s^2 for 15 seconds to reach a speed of v m/s.
The particle then continues at this speed for 40 seconds before slowing down.
It comes to a stop at 80 seconds.



(a) Calculate the speed, v m/s, of the particle.

Answer v =..... [2]

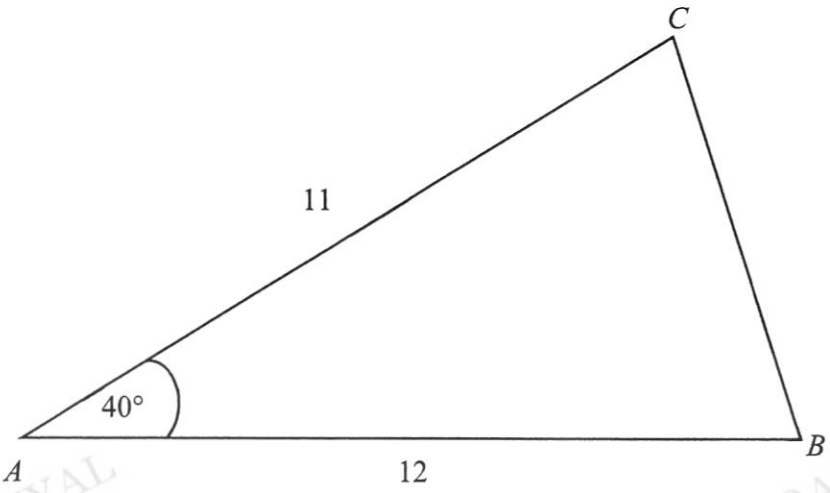
(b) James claims that 71 seconds is required for the particle to cover a distance of 4 km.
Do you agree with James? Show your calculations clearly.

Answer .....

.....

..... [3]

10 In triangle ABC, $AB = 12$ cm, $AC = 11$ cm and angle $BAC = 40°$.



Calculate

(a) the area of triangle ABC,

Answer ..... cm^2 [2]

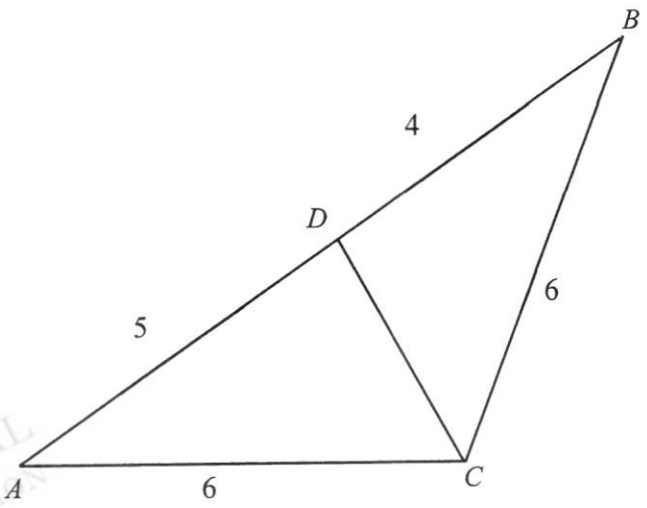
(b) the length of BC,

Answer ..... cm [2]

(c) the perpendicular distance from A to BC.

Answer ..... cm [2]

11 Triangle ABC is an isosceles triangle with $AC = BC = 6$ cm. D is on AB such that $AD = 5$ cm and $DB = 4$ cm.



(a) Show that triangle ABC is similar to triangle BCD.

[2]

(b) State the length of DC.

Answer ..... cm [1]

(c) Find $\dfrac{\text{area of } \Delta ABC}{\text{area of } \Delta BCD}$.

Answer ..... [2]

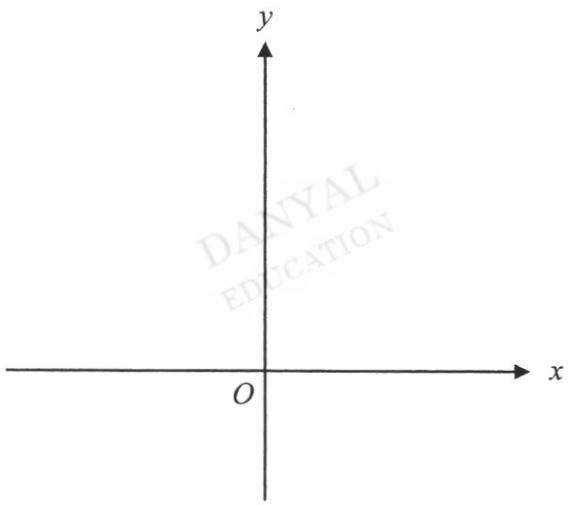
(d) Find $\dfrac{\text{area of } \Delta BCD}{\text{area of } \Delta ADC}$.

Answer ..... [1]

12 **(a)** Express $x^2 - 3x - 2$ in the form $(x-q)^2 + p$.

Answer ..... [2]

(b) **Sketch** the graph of $y = x^2 - 3x - 2$ on the axes below.
Indicate clearly the values where the graph crosses the x-axis and the y-axis.



[2]

(c) Write down the coordinates of the minimum point of the graph of $y = x^2 - 3x - 2$.

Answer (..... , ...) [1]

(d) Write down the equation of the line of symmetry for the graph of $y = x^2 - 3x - 2$.

Answer ..... [1]

13 **(a)** Given that $2^a = 5$, find the value of

(i) 8^a,

Answer ..... [2]

(ii) 2^{1-a}.

Answer ..... [2]

(b) Solve the equation $\sqrt{7^x} = \frac{1}{343}$.

Answer $x =$ ..... [3]

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NORTHBROOKS SECONDARY SCHOOL
End-of-Year Examination 2021
Secondary 3 Express

CANDIDATE NAME			
CLASS		REGISTER NUMBER	

MATHEMATICS 4048/02

Paper 2

5 October 2021

1 hour 30 minutes

Candidates answer on the Question Paper.

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Q1	Q2	Q3	Q4	Q5	Q6	60

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Setter: Audrey Chong

Mathematical Formulae

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Statistics

$$\text{Mean} = \frac{\sum fx}{\sum f}$$

$$\text{Standard deviation} = \sqrt{\frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f}\right)^2}$$

Answer **all** the questions.

1 **(a)** Simplify $\frac{15bc^2}{12} \div \frac{75b^3}{4c^2}$.

Answer ..... [2]

(b) Express as a single fraction in its simplest form $\frac{7}{(2-x)^2} - \frac{4}{x-2}$.

Answer ..... [2]

(c) Simplify $\frac{3d^2+5d-2}{9d^2-1}$.

Answer ..... [3]

(d) Solve the equation $32^{2x}=\frac{1}{8}$.

Answer x =..... [3]

2 A swimming pool has a capacity of 4500 litres.
Tap A can fill the swimming pool at a rate of x litres per minute.
Tap B can fill the swimming pool at a rate of $(x-10)$ litres per minute.

(a) Write down an expression, in terms of x, for the number of minutes it would take to fill the swimming pool using tap A.

Answer .....min [1]

(b) Write down an expression, in terms of x, for the number of minutes it would take to fill the swimming pool using tap B.

Answer .....min [1]

(c) It takes 30 minutes longer to fill the swimming pool using tap B than it does using tap A.
Write down an equation to represent this information and shows that it reduces to

$$x^2 - 10x - 1500 = 0.$$

Answer

[3]

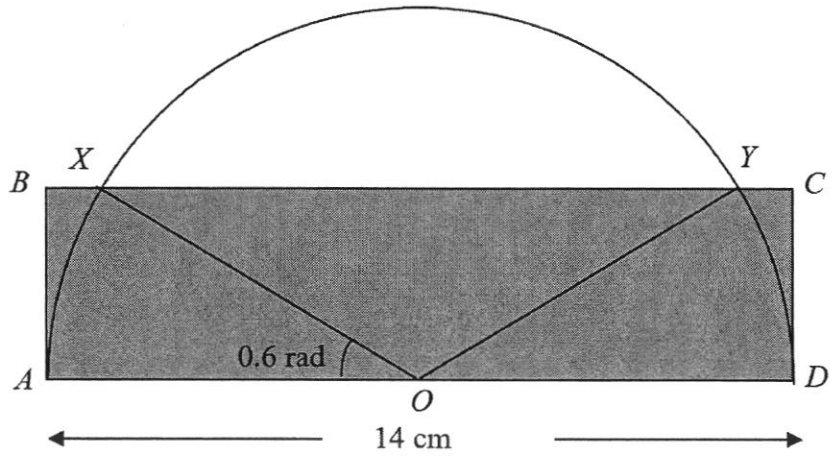
(d) Solve the equation $x^2 - 10x - 1500 = 0$, giving your solutions correct to two decimal places.

Answer $x =$..... or..... [3]

(e) Calculate how long it would take to fill the empty swimming pool using tap A and tap B together.
Give your answer in minutes and seconds, correct to the nearest ten seconds.

Answer .....minutes .....seconds [2]

3



ABCD is a rectangle and *O* is the midpoint of *AD*.
A semicircle with diameter *AD* =14 cm is drawn.
The semicircle cuts the side *BC* at *X* and *Y*. Angle *AOX* = 0.6 radians.

Calculate

(a) the length of arc *XY*,

Answer ..... cm [2]

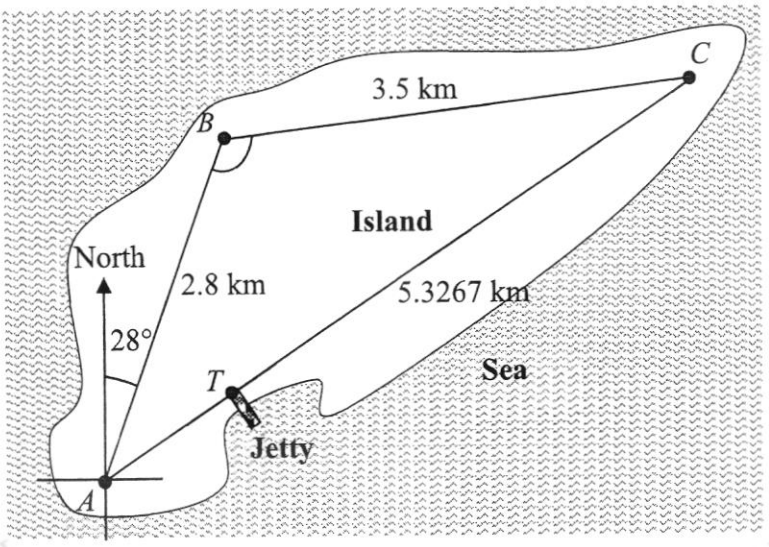
(b) the length *CD*,

Answer ..... cm [2]

(c) the unshaded area of the diagram.

Answer ..... cm^2 [3]

4



A, B and C are 3 popular spots on the island.
T represents the location of a jetty on the island.
T is due south of B and it lies on the line joining A and C.
$AB = 2.8$ km, $BC = 3.5$ km and $AC = 5.3267$ km.
The bearing of B from A is 028°.

(a) Calculate angle ABC.

Answer .....[3]

(b) Calculate the bearing of C from A.

Answer ..... [3]

(c) Calculate the distance of T from A.

Answer ..... km [2]

(d) A plane is 760 m vertically above A while a control tower stands at T.
The control tower has a height of 90 m.
The plane is able to view any object within 25° from its line of sight.

John commented that the plane will be able to see the control tower while at A.
Do you agree? Explain your answer.

Answer

[2]

5 The variables x and y are connected by the equation $y = 2x + \frac{18}{x} - 11$.

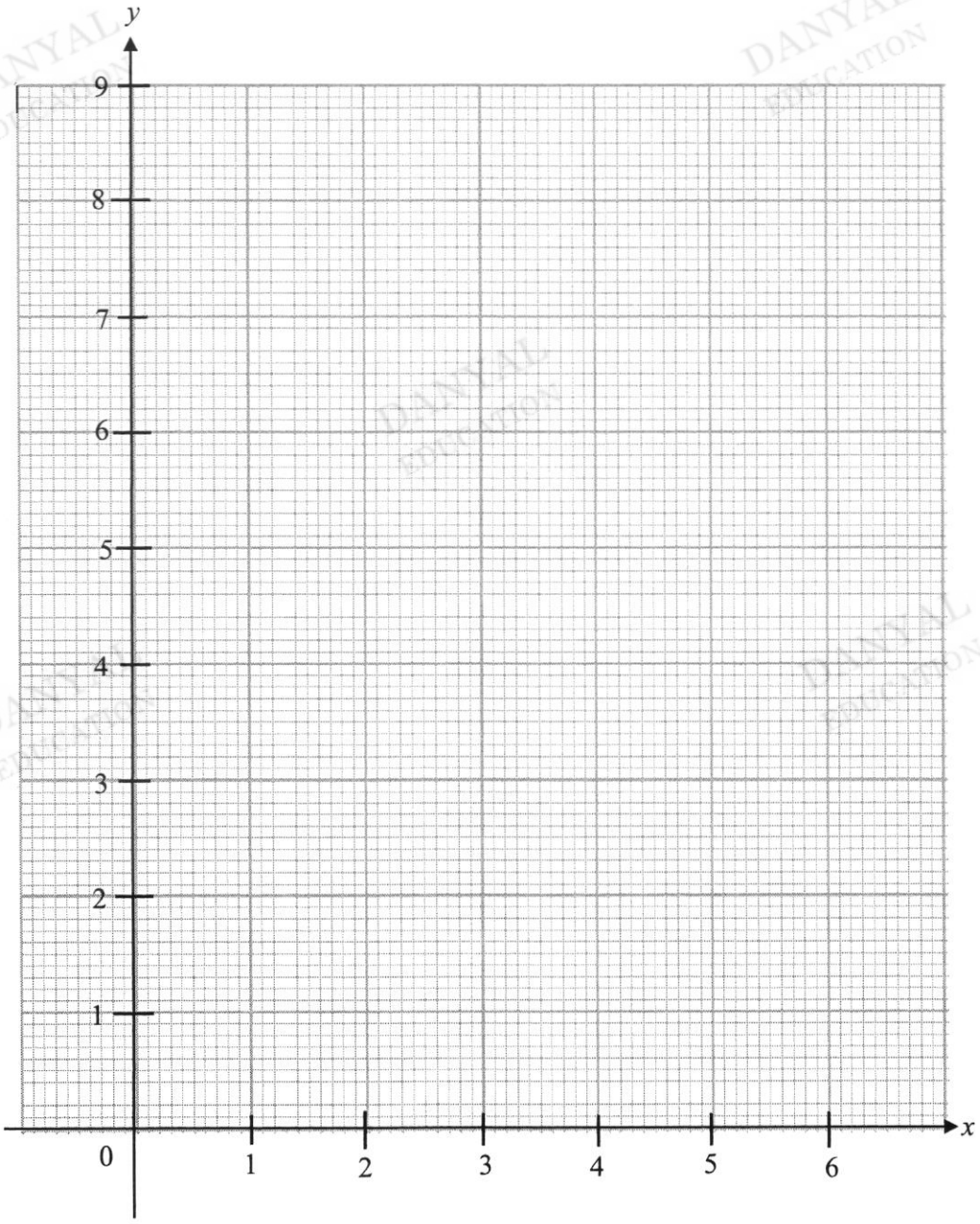
Some corresponding values of x and y are given in the table below.

x	1	1.5	2	3	4	5	6
y	9	4	2	1	p	2.6	4

(a) Find the value of p.

Answer $p =$ ..... [1]

(b) On the grid, draw the graph of $y = 2x + \frac{18}{x} - 11$ for $1 \leq x \leq 6$.



[3]

(c) By drawing a tangent line, find the gradient of the curve at (2, 2).

Answer ..... [2]

(d) **(i)** On the grid in part **(b)**, draw the line $y = \frac{1}{2}x + 1$ for $0 \leq x \leq 6$. [2]

(ii) Write down the x-coordinates of the points where this line intersects the curve.

Answer x =..... and ..... [2]

6 *XYZ* bank offered two promotion plans for new customers opening a deposit savings account.

Plan A	Plan B
Minimum deposit of \$3500. For the first \$3500, customers get a flat rate of 0.08% simple interest per annum. For subsequent amount, customers get a flat rate of 0.92% simple interest per annum.	No minimum amount required. Compound interest at a rate of x% per annum.

(a) Grace deposited \$10 000 under Plan A.

Calculate the total amount in her account after four years.

Answer \$..... [3]

(b) Wilson deposited \$10 000 under Plan B.
His total amount is the same as Grace's after four years.

Calculate the value of x.

Answer x =..... [3]

(c) Grace intends to deposit her money for 5 years.
She claimed that Plan A is better than Plan B.

Do you agree with Grace's claim?
Explain your answer.

Answer

[3]

To reward customers, *XYZ* Bank decided to launch an *X*-Miles Credit Card.
The details of the *X*-Miles Credit Card are as follows:

- There is a welcome gift of 14 000 miles for new card holders.
- Customers need to pay a credit card fee of $198.20 per year, from the second year onwards.
- When the credit card fee is paid, customers earn 8000 miles.
- Miles accumulated can be used to exchange for plane tickets with a one-time transaction fee of $25.
- For every $1 spent locally, customers earn 1.15 miles.
  This does not apply to the credit card fee and the one-time transaction fee.

(d) A return plane ticket from Singapore to New York requires 120 000 miles for redemption. Wilson is applying for the credit card for the first time.

Calculate the minimum amount Wilson has to pay in total so that he can redeem the ticket 3 years after he has signed up.

Answer $..... [4]

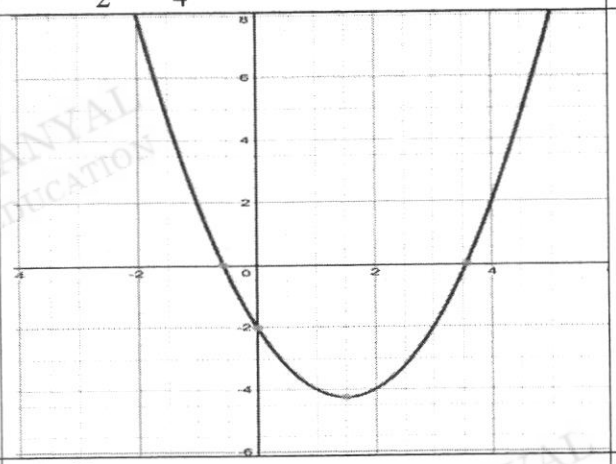
NORTHBROOKS SECONDARY SCHOOL
MATHEMATICS DEPARTMENT
3 EXPRESS
END-OF-YEAR EXAM 2021 PAPER 1

MARKING SCHEME

Qn	Answer	Marks	Remarks
1	58.3° or 121.7°	B1 B1 Total: 2 Marks	
2	$(\frac{h}{50})^3 = \frac{1}{2}$ $\frac{h^3}{125000} = \frac{1}{2}$ $h^3 = \frac{1}{2} \times 125000$ $h = \sqrt{\quad}$ $h = 39.6850$ $h = 39.7$ cm	M1 A1 Total: 2 Marks	
3	$(2x-4)^2 = 81$ $2x-4 = \pm\sqrt{81}$ $2x-4 = \pm 9$ $2x-4 = 9$ or $2x-4 = -9$ $x = \frac{9+4}{2}$ or $x = \frac{-9+4}{2}$ $x = 6.5$ or $x = -2.5$	 M1 A1, A1 Total: 3 marks	
4	Let x be the number of \$10 note $10x + 5(12-x) < 95$ $10x + 60 - 5x < 95$ $5x + 60 < 95$ $5x < 95 - 60$ $5x < 35$ $x < 7$ He has a maximum 6 pieces of \$10 notes	 M1 M1 M1 A1 Total: 4 marks	
5	$0 \le 3(1-2x)$ and $3(1-2x) < x+1$ $0 \le 3-6x$ and $3-6x < x+1$ $3-6x \ge 0$ and $-6x-x < -3+1$ $-6x \ge -3$ and $-7x < -2$ $x \le \frac{3}{6}$ and $x > \frac{2}{7}$ $x \le \frac{1}{2}$ and $x > \frac{2}{7}$ $\frac{2}{7} < x \le \frac{1}{2}$	M1 M1 A1 Total: 3 marks	

6a	$6.963\times10^{7}-5\ 902\ 000$ $=6\ 963\ 000\ -\ 5\ 902\ 000$ $=63\ 728\ 000$ $=6.3728\times10^{7}$	M1 A1	
b	$\frac{3.195\times10^{7}}{2.706\times10^{8}}\times100\%$ $=11.807$ $=11.8\%$	M1 A1 Total : 4 marks	
7a	Graph B	B1	
b	Graph D	B1	
c	Graph C	B1	
d	Graph A	B1 Total: 4 marks	
8a	-3	B1	
8b	If we substitute x with 2 $6x+2y=7$ $6(2)+2y=7$ $12+2y=7$ $2y=7-12$ $2y=-5$ $y=-2.5$ Hence, coordinate (2, -3) does not lie on the line.	 M1 A1	
8c	$y=mx+c$ $5=(-3)(3)+c$ $5=-9+c$ $c=14$ $y=-3x+14$	M1 M1 A1	
8d	Length of AB $\sqrt{(5-(-3))^{2}+(3-2)^{2}}$ $==\sqrt{64+1}$ $=8.06$	M1 A1 Total: 8 marks	
9a	$\frac{v}{15}=4.5$ $v=4.5\times15$ $v=67.5$ m/s	M1 A1	
9b	Let the speed at 71st second be x $\frac{x}{9}=\frac{67.5}{25}$ $x=\frac{67.5}{25}\times9$ $x=24.3$ m/s	M1	

	Full distance of travelling $=0.5\times67.5\times(55+40)+0.5\times16\times(67.5+24.3)$ $=3940.65m$ $=3.94065km$ Disagree, as in 71 s, the particle can only cover a distance $3.94065km$. Hence, a longer time is required for the particle to cover a distance of 4km.	M1 A1 Total: 5 marks	
10a	Area $=\frac{1}{2}\times11\times12\times\sin40$ $=42.4240$ $=42.4\ \text{cm}^2$	M1 A1	
10b	$BC^2=11^2+12^2-2(11)(12)\cos40$ $BC=\sqrt{11^2+12^2-2(11)(12)\cos40}$ $BC=7.9224$ $BC=7.92\ \text{cm}$	M1 A1	
10c	$Area=\frac{1}{2}\times base\times height$ $42.4240=\frac{1}{2}\times7.9224\times height$ $height=\frac{42.4240}{\frac{1}{2}\times7.9224}$ $height=10.7099$ $height=10.7\ \text{cm}$ Hence, the perpendicular distance from A to BC is 10.7 cm.	M1 A1 Total: 6 marks	
11a	$\frac{AB}{BC}=\frac{9}{6}$ $\angle BAC=\angle CBD$ (ΔABC is an isosceles triangles) $\frac{AC}{BD}=\frac{6}{4}$ $=\frac{3}{2}$ By SAS, ΔABC is similar to ΔBCD	B (2,1,0)	
b	$\frac{DC}{CB}=\frac{DB}{CA}$ $\frac{DC}{6}=\frac{4}{6}$ $DC=4\ \text{cm}$	B1	

c	$\frac{\text{area of } \Delta ABC}{\text{area of } \Delta BCD} = \left(\frac{3}{2}\right)^2$ $\frac{\text{area of } \Delta ABC}{\text{area of } \Delta BCD} = \frac{9}{4}$	M1 A1	
d	$\frac{\text{area of } \Delta BCD}{\text{area of } \Delta ADC} = \frac{4}{5}$	B1 Total: 6 marks	
12a	$x^2 - 3x - 2$ $= (x - \frac{3}{2})^2 - \frac{9}{4} - 2$ $= (x - \frac{3}{2})^2 - \frac{17}{4}$	 B1, B1	
12b		B1 for the correct curve B1 for the correct label of x-intercepts and y-intercept	
12c	$(\frac{3}{2}, \frac{17}{4})$	B1	
12d	$x = \frac{3}{2}$	B1 Total:6 marks	
13ai	8^a $= (2^3)^a$ $= (2^a)^3$ $= 5^3$ $= 125$	 M1 A1	
13aii	2^{1-a} $= 2 \div 2^a$ $= \frac{2}{5}$ or 0.4	M1 A1	
13b	$\sqrt{7^x} = \frac{1}{343}$ $7^{\frac{x}{2}} = 7^{-3}$ $\frac{x}{2} = -3$ $x = -6$	 M1, M1 A1 Total: 7 marks	M1 each for correct answer on LHS and RHS

NORTHBROOKS SECONDARY SCHOOL
MATHEMATICS DEPARTMENT
3 EXPRESS
END-OF-YEAR EXAM 2021 PAPER 2

MARKING SCHEME

Qn	Answer	Marks	Remarks
1(a)	$\frac{15bc^2}{12} \div \frac{75b^3}{4c^2}$ $= \frac{15bc^2}{12} \times \frac{4c^2}{75b^3}$ $= \frac{c^4}{15b^2}$	M1 A1	
1(b)	$\frac{7}{(2-x)^2} - \frac{4}{x-2}$ $= \frac{7+4(2-x)}{(2-x)^2}$ $= \frac{7+8-4x}{(2-x)^2}$ $= \frac{15-4x}{(2-x)^2}$ or $\frac{7}{(2-x)^2} - \frac{4}{x-2}$ $= \frac{7}{(x-2)^2} - \frac{4(x-2)}{(x-2)^2}$ $= \frac{7-4x+8}{(x-2)^2}$ $= \frac{15-4x}{(x-2)^2}$	M1 A1 M1 A1	
1(c)	$\frac{3d^2+5d-2}{9d^2-1}$ $= \frac{(3d-1)(d+2)}{(3d+1)(3d-1)}$ $= \frac{d+2}{3d+1}$	M1, M1 A1	1 mark for factorising numerator, 1 mark for factorising denominator
1(d)	$32^{2x} = \frac{1}{8}$ $2^{10x} = 2^{-3}$ $10x = -3$ $x = -\frac{3}{10}$	M1, M1 A1	

2(a)	$\frac{4500}{x}$	B1	
2(b)	$\frac{4500}{x-10}$	B1	
2(c)	$\frac{4500}{x-10}-\frac{4500}{x}=30$ $\frac{4500x-4500(x-10)}{x(x-10)}=30$ $4500x-4500x+45000=30x(x-10)$ $30x^2-300x-45000=0$ $x^2-10x-1500=0$ (shown)	M1 M1 A1	
2(d)	$x=\frac{-(-10)\pm\sqrt{(-10)^2-4(1)(-1500)}}{2(1)}$ $=\frac{10\pm\sqrt{6100}}{2}$ $=44.05$ or -34.05	M1 A1, A1	
2(e)	$\frac{4500}{44.05+(44.05-10)}$ $=\frac{4500}{78.1}$ $=57.618$ min =57 min 40 sec (nearest tens)	M1 A1	
3(a)	Arc length XY $=7(\pi-0.6-0.6)$ ≈ 13.6 cm	 M1 A1	
3(b)	$\sin 0.6=\frac{CD}{7}$ $CD=7\times\sin 0.6$ $CD\approx 3.95$ cm	M1 A1	
3(c)	$\frac{\pi(7)^2}{2}-2\left(\frac{1}{2}\times 7^2\times 0.6\right)-\left[\frac{1}{2}\times 7^2\times\sin(\pi-1.2)\right]$ ≈ 24.7 cm^2 or $\frac{1}{2}(7)^2(\pi-0.6-0.6)-\frac{1}{2}(7)^2\sin(\pi-0.6-0.6)$ ≈ 24.7 cm^2	M1, M1 A1 M1, M1 A1	1 mark for area of 2 sectors, 1 mark for area of triangle 1 mark for area of sector, 1 mark for area of triangle

4(a)	$5.3267^2 = 3.5^2 + 2.8^2 - 2(3.5)(2.8)\cos\angle ABC$ $\angle ABC = \cos^{-1}\left(\frac{5.3267^2 - 3.5^2 - 2.8^2}{-2(3.5)(2.8)}\right)$ $\angle ABC = 115.001°$ $\approx 115.0°$ or $5.3267^2 = 3.5^2 + 2.8^2 - 2(3.5)(2.8)\cos\angle ABC$ $\angle ABC = \cos^{-1}\left(\frac{3.5^2 + 2.8^2 - 5.3267^2}{2(3.5)(2.8)}\right)$ $\angle ABC = 115.001°$ $\approx 115.0°$	M1 M1 A1 M1 M1 A1	
4(b)	$\angle BAC = \cos^{-1}\left[\frac{3.5^2 - 2.8^2 - 5.3267^2}{-2(2.8)(5.3267)}\right]$ $= 36.548°$ Bearing of C from A = 28°+36.548° $= 064.5°$ or	M1 M1 A1	
	$\frac{\sin\angle BAC}{3.5} = \frac{\sin 115.001°}{5.3267}$ $\angle BAC = \sin^{-1}\left(\frac{\sin 115.001°}{5.3267} \times 3.5\right)$ $\angle BAC = 36.5483$ or $180° - 36.5483$ $=143.4517°$ (rej) Bearing of C from A $= 36.5483° + 28°$ $= 064.5483°$ $\approx 064.5°$	M1 M1 A1	
4(c)	$\frac{AT}{\sin 28°} = \frac{2.8}{\sin\angle ATB}$ $\frac{AT}{\sin 28°} = \frac{2.8}{\sin(180° - 36.548° - 28°)}$ $AT = \frac{2.8}{\sin 115.452°} \times \sin 28°$ $=1.4558$ ≈ 1.46 km	M1 A1	
4(d)	Let θ be the angle of depression of the control tower from the plane.	M1	

	$\theta = \tan^{-1}\left(\frac{760-90}{1455.8}\right)$ $= \tan^{-1}\left(\frac{670}{1455.8}\right)$ $= 24.713°$ **Yes**, I **agree** with John. The angle of depression of the control tower from the plane is less than 25°, which means it is within the plane's line of sight.	A1	A1- to agree with John and provide reasoning
5(a)	$p = 1.5$	B1	
5(b)	(attached graph at the back) Points plotted correctly Smooth curve passing through all points	B2,1,0 B1	
5(c)	Tangent line drawn Gradient = -2.71 to -1.91	B1 B1	
5(di)	Table of values x: 1, 3, 6 y: 1.5, 2.5, 4 Straight line drawn	B1 B1	
5(dii)	$x = 2, x = 6$	B1, B1	
6(a)	Interest after 4 years $= \frac{3500 \times 0.08 \times 4}{100} + \frac{6500 \times 0.92 \times 4}{100}$ $= 11.20 + 239.20$ $= \$250.40$ Total amount = \$10 000 + \$250.40 = \$10 250.40	M1, M1 A1	
6(b)	$10000\left(1+\frac{x}{100}\right)^4 = 10250.40$ $\left(1+\frac{x}{100}\right)^4 = 1.02504$ $1+\frac{x}{100} = \sqrt[4]{1.02504}$ $\frac{x}{100} = \sqrt[4]{1.02504} - 1$ $x = 100(\sqrt[4]{1.02504} - 1)$ $x = 0.6202$ ≈ 0.620	M1 M1 A1	
6(c)	Interest for Plan A in the 5th year $= \frac{3500 \times 0.08 \times 1}{100} + \frac{6500 \times 0.92 \times 1}{100}$ $= \$62.60$ Interest for Plan B in the 5th year $= 10250.40\left(1+\frac{0.6202}{100}\right) - 10250.40$ $= \$63.57$ $> \$62.60$	M1 M1	

	No, I disagree with Grace as plan B will yield more interest than Plan A.	A1	
6(d)	Total amount spent locally = Amount converted to miles + Extra fees $=\frac{120000-14000-8000(2)}{1.15}$ $+198.20(2)+25$ =\$78 260.869 + \$396.40 + \$50 =\$78 682.27 (2dp)	 M1 M1, M1 A1	