East Spring Secondary School
Towards Excellence and Success

Name: _____( )

Class: Sec 2C

Second Semester Examination 2018
Secondary Two Normal Technical

Mathematics
Paper 1

4046/1

5th Oct 2018
Friday

45 min
0800 –0845

INSTRUCTIONS TO CANDIDATES

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

Answer **all** questions.

INFORMATION FOR CANDIDATES
The number of mark is given in brackets [ ] at the end of each question or part question.

If working is needed for any question it must be shown in the space below that question.
Omission of essential working will result in loss of marks.
The total of the marks for this paper is **25**.

You are expected to use a Scientific Calculator to evaluate explicit numerical expressions. If the degree of accuracy is not specified in the question and if the answer in 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.

Total Marks: 25

This question paper consists of **6** printed pages including the cover page.

Mathematical Formulae

Mathematical Formulae

Numbers and Algebra

Compound Interest

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

Quadratic equation $ax^2 + bx + c = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Geometry and Mensuration

Curve surface area of a cone = πrl

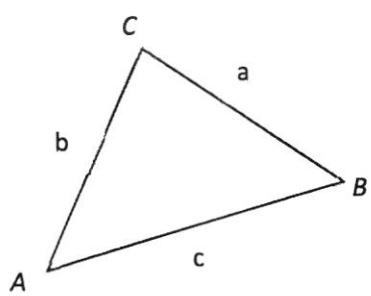
Surface area of a sphere = $4\pi r^2$

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

Volume of a pyramid = $\frac{1}{3} \times base\ area \times height$

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

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



1. Simplify the following:

(a) $5a - 2a$

Answer: (a)_____ [1]

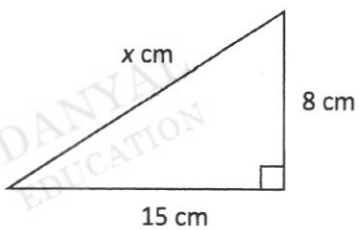
(b) $3b + 8 + 6b - 4$

Answer: (b)_____ [1]

(c) $\frac{7}{12}c - \frac{1}{4}c$

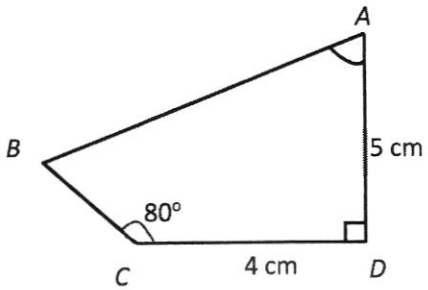
Answer: (c)_____ [2]

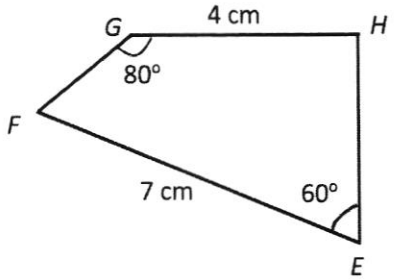
2. For the triangle below, find the length of the unknown side.



Answer: $x =$_____ cm [2]

3. Given that $ABCD \equiv EFGH$, find the following:





(a) the length of AB,
(b) the length of HE,
(c) $\angle BAD$,
(d) $\angle GHE$.

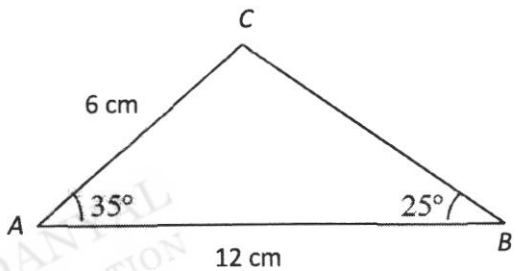
Answer: (a)_____ cm [1]

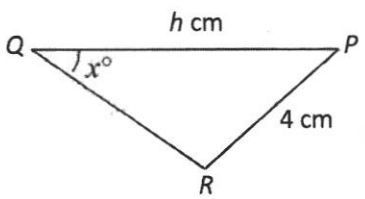
(b)_____ cm [1]

(c)_____ ° [1]

(d)_____ ° [1]

4. In the following figures, ΔABC is similar to ΔPQR. Find the values of the unknowns.





Answer: (a) h =_____ cm [2]

(b) $x°$ =_____ ° [1]

5. Janson can complete 5 paintings in 3 days. At this rate, how many days would he need to complete 25 paintings?

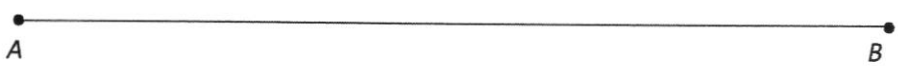
Answer: _____days [2]

6. A bag contains 8 green balls, 5 red balls and 7 blue balls. A ball is chosen at random. Find the probability that
   (a) the ball is green,
   (b) the ball is not blue.

Answer: (a)_____ [1]

(b)_____ [1]

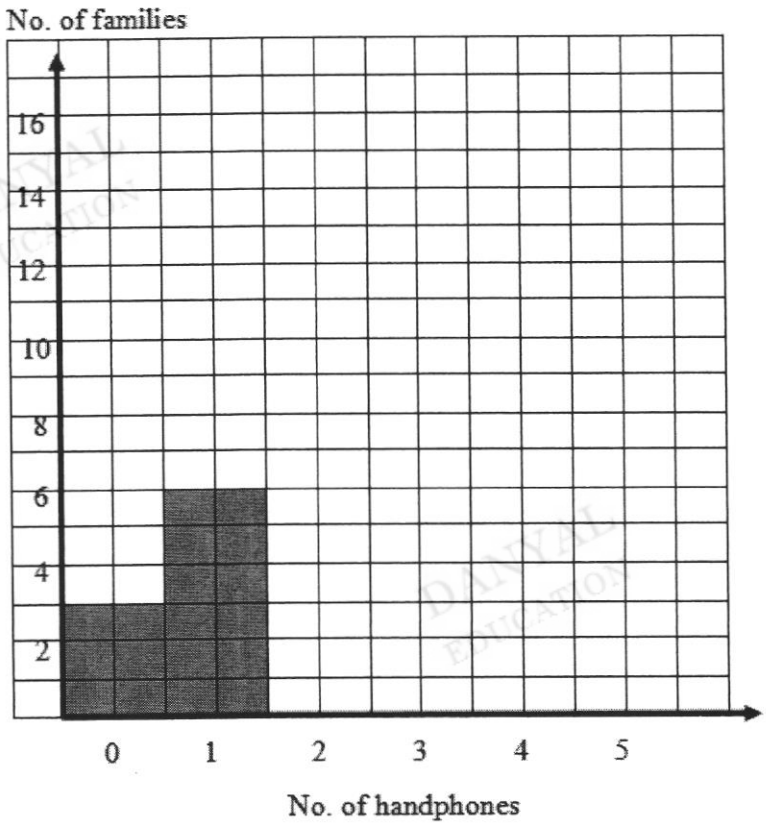
7. Two points *A* and *B* are shown below.
   (a) Construct triangle *ABC* such that *AC* = 6 cm and *BC* = 10 cm. [2]
   (b) Construct the angle bisector of $\angle ABC$. [1]



8. The table shows the number of handphones owned by 50 families.

No. of handphones	0	1	2	3	4	5
No. of families	3	6	10	15	9	7

(a) Complete the histogram, displaying the number of handphones owned. [2]



(b) What is the most common number of handphones owned by a family?

(c) Calculate the average number of handphones owned by each family.

Answer: (a)_____ [1]

(b)_____ [2]

---END OF PAPER---

East Spring Secondary School
Towards Excellence and Success

Name: _____( )

Class: Sec 2C

Second Semester Examination 2018
Secondary Two Normal Technical

Mathematics
Paper 2

4046/2

2nd Oct 2018
Tuesday

45 min
0800 – 0845

INSTRUCTIONS TO CANDIDATES

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

Answer **all** questions.

INFORMATION FOR CANDIDATES
The number of mark is given in brackets [ ] at the end of each question or part question.

If working is needed for any question it must be shown in the space below that question.
Omission of essential working will result in loss of marks.
The total of the marks for this paper is **25**.

You are expected to use a Scientific Calculator to evaluate explicit numerical expressions. If the degree of accuracy is not specified in the question and if the answer in 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.

Total Marks: 25

This question paper consists of **6** printed pages including the cover page.

Mathematical Formulae

Numbers and Algebra

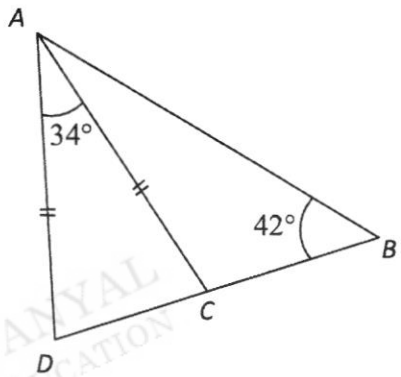
Compound Interest

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

Quadratic equation $ax^2+bx+c=0$

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

1. In the diagram, *BCD* is a straight line. $AD = AC$, $\angle DAC = 34°$ and $\angle ABC = 42°$.
Giving your reasons, find
(a) $\angle ADC$.
(b) $\angle BAC$.



Answer: (a)_____° [2]

(b)_____° [2]

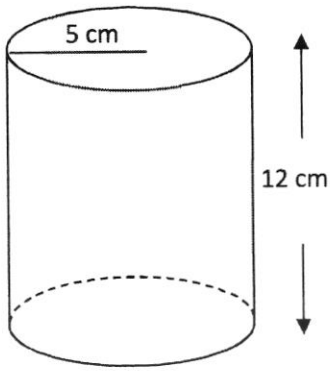
2. Afiq can cycle a distance of 1200 metres in 30 seconds.
(a) What is his speed in m/s?

Answer: (a)_____m /s [1]

(b) If Crystal cycles at the same speed for 1.5 km, calculate the time taken for her to reach her destination, in seconds.

Answer: (b)_____ s [2]

3.



(a) A cylinder has a base radius of 5 cm and a height of 12 cm. Taking $\pi = 3.142$, calculate the total surface area of the cylinder.

Answer: (a)_____ cm^2 [2]

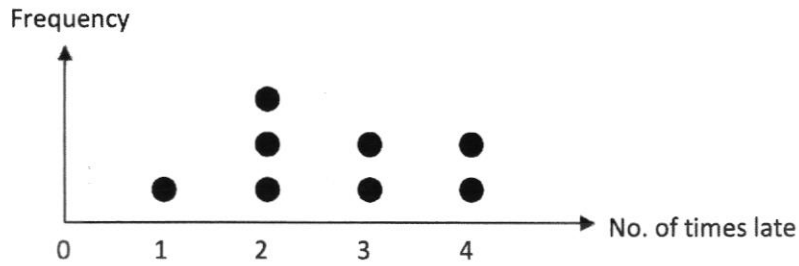
(b) the volume of the cylinder.

Answer: (b)_____ cm^3 [2]

4. Mr Wong borrowed $55 000 at a 3.5% annual interest rate for 5 years. What is the simple interest due on the loan for the 5 years?

Answer: $_____ [2]

5. The data below shows the number of times that eight Sec 2 students were late for school for the month of October.



Find
(a) the median.

Answer: (a)_____ [1]

(b) the mean.

Answer: (b)_____ [2]

(c) the mode.

Answer: (c)_____ [1]

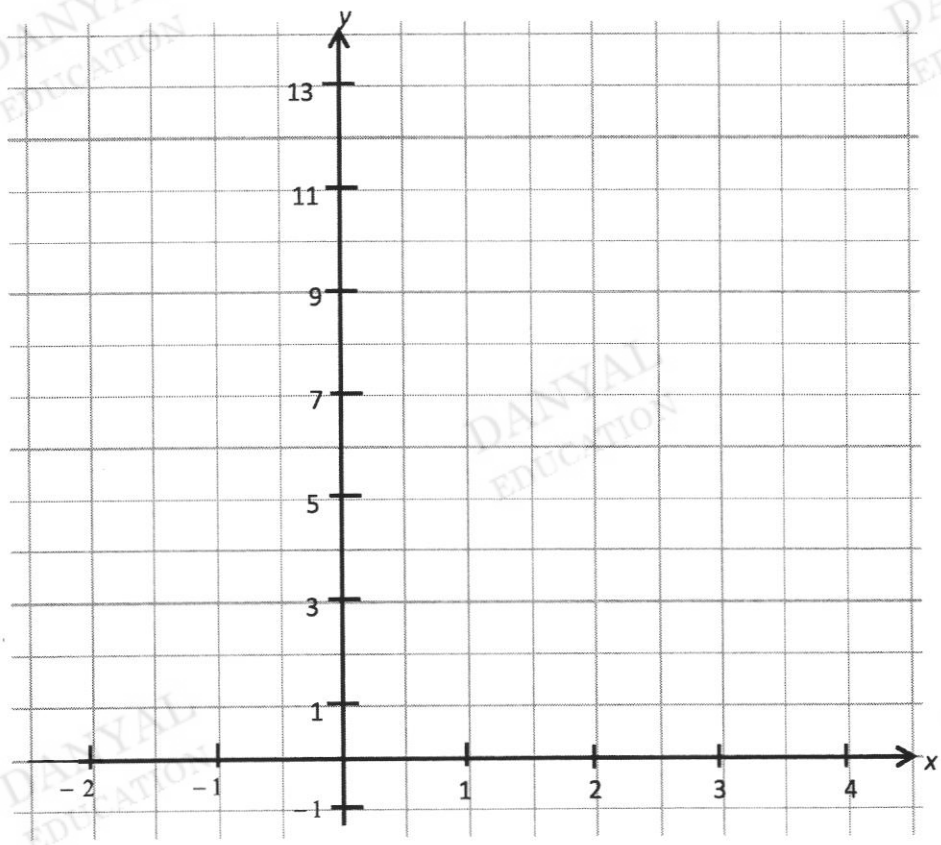
6. (a) Complete the table below. [2]

x	-2	-1	0	1	2	3	4
$y = 2x + 3$		1	3		7	9	11

(b) Draw the graph of $y = 2x + 3$ for values of x from -2 to 4 in the grid provided. [2]

(c) From the graph,
(i) find the value of y when $x = -0.5$.
(ii) find the value of x when $y = 8$.

(d) State the gradient and y-intercept of this line.



Answer: (c) (i)_____ [1]

(ii)_____ [1]

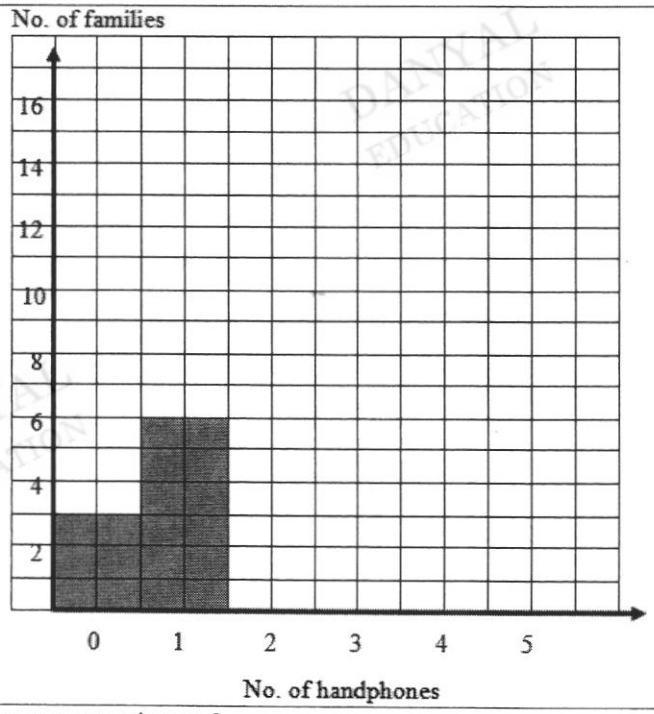
(d) Gradient =_____ [1]

y-intercept =_____ [1]

---END OF PAPER---

2NT 2SE P1 2018 Answer Scheme

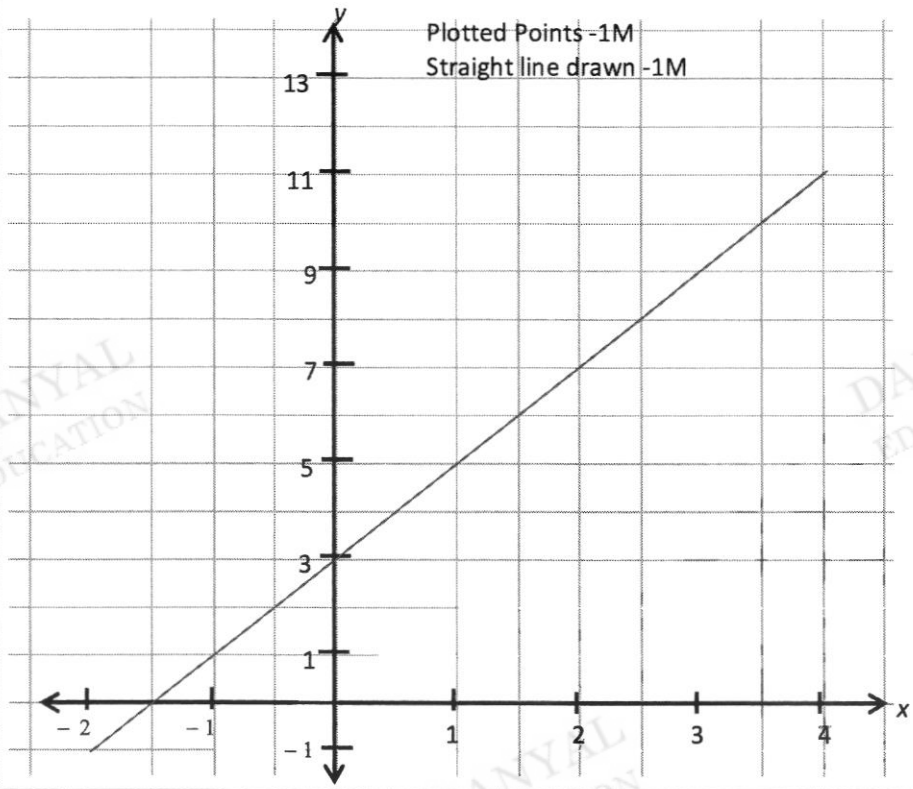
1 a	$3a$	B1
b	$9b + 4$	B1
c	$\frac{7}{12}c - \frac{1}{4}c = \frac{7}{12}c - \frac{3}{12}c$ $= \frac{4}{12}c = \frac{1}{3}c$	M1 A1
2	$15^2 + 8^2 = x^2$ $x^2 = 289$ $x = \sqrt{289}$ $x = 17$	M1 A1
3 a	$AB = EF = 7\ cm$	B1
b	$HE = DA = 5\ cm$	B1
c	$\angle BAD = \angle FEH = 60°$	B1
d	$\angle GHE = \angle CDA = 90°$	B1
4 a	$\frac{AB}{AC} = \frac{PQ}{PR}$ $\frac{12}{6} = \frac{h}{4}$ $6h = 48$ $h = 8\ cm$	M1 A1
b	$x° = \angle ABC = 25°$	B1
5	5 paintings ➔3 days 25 paintings ➔3 × 5 $= 15\ days$	M1 A1
6 a	P(green)= $\frac{8}{20}$ $= \frac{2}{5}$	B1
b	P(not blue)= $\frac{13}{20}$ $= 1 - \frac{7}{20}$ $= \frac{13}{20}$	B1

7		Correct dimension – 1M Labelling -1M Correct angle bisector – 1M
8 a		B2 1M for every 2 correct columns.
b	Most common number = 3	B1
c	Average number= $\frac{(0\times3)+(1\times6)+(2\times10)+(3\times15)+(4\times9)+(5\times7)}{3+6+10+15+9+7}$ $= 2.84$	M1 A1

2NT 2SE P2 2018 Answer Scheme

1a	$\angle ADC = \frac{180-34}{2}\ (base\ \angle s\ of\ isos\ \Delta)$ $= 73°$	M1 A1
b	$\angle BAC = 73° - 42°\ (ext.\angle\ of\ \Delta)$ $= 31°$	M1 A1
2a	Speed $= \frac{1200}{30}$ $= 40$ m/s	B1
2b	$1.5\ km = 1500\ m$ Time taken$= \frac{1500}{40}$ $= 37.5s$	M1 A1
3a	$S.A\ of\ cylinder = [\pi(5)^2 \times 2] + [2\pi(5)(12)]$ $= 534.14$ $\approx 534\ cm^2$	M1 A1
b	$Vol\ of\ cylinder = \pi(5)^2(12)$ $= 942.6\ cm^3$ $\approx 943\ cm^3$	M1 A1
4	Simple interest $= 55000 \times \frac{3.5}{100} \times 5$ $= \$9625$	M1 A1
5a	Median $= 2.5$	B1
b	Mean $= \frac{\qquad\qquad}{8}$ $= 2.625$	M1 A1
c	Mode $= 2$	B1
6a		B2

x	-2	-1	0	1	2	3	4
$y = 2x + 3$	-1	1	3	5	7	9	11

b		B2
c	(i) $y = 2$ (ii) $x = 2.5$	B1 B1
d	$Gradient = 2$ $y - intercept = 3$	B1 B1