中正中学 义顺

CHUNG CHENG HIGH SCHOOL (YISHUN)

E

# 2020 End-Of-Year Examination
## Secondary One Express

CANDIDATE NAME

CLASS

INDEX NUMBER

# MATHEMATICS

7 October 2020

**Section A**

**2 hours**

Additional Materials: NIL

**READ THESE INSTRUCTIONS FIRST**

Write your name, index number and class in the spaces at the top of this page.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions in Section A and Section B. **You are advised to spend not more than 1 hour in each section.**

If working is needed for any question, it must be shown with the answer.
Omission of essential workings and units will result in loss of marks.
You are reminded of the need for clear presentation in your answers.

Leave your answer in the simplest form. Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place in the case of angles in degrees, unless a different level of accuracy is specified in the question.

The use of an approved scientific calculator is expected, where appropriate.

For $\pi$, use your calculator value, unless the question requires the answer in terms of $\pi$.

The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this section is 52.

| For Examiner's Use | |
|---|---|
| Section A | / 52 |
| Section B | / 48 |
| Total | / 100 |

Setter: Isma Wati Sidik

**1.** Use your calculator to evaluate $\dfrac{655.998\times(8.0498)^2}{\sqrt{2}}$.

**(a)** Give your answer correct to two significant figures.

*Answer (a)* ..... [1]

**(b)** Give your answer correct to two decimal places.

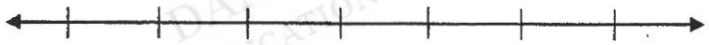
*Answer (b)* ..... [1]

---

**2.** Represent the following numbers on the number line provided in the answer space.

$$\frac{7}{3},\ (-1)^2,\ \pi,\ -2.\dot{5}$$

*Answer:*



[2]

---

**3.** **(a)** Express 1715 as a product of its prime factors in index notation.

*Answer (a)* ..... [2]

---

**(b)** A square has an area of integer value, $(1715p)\text{cm}^2$. Write down the smallest possible integer value of $p$.

*Answer (b)* $p =$ ..... [1]

---

**4.** 1155 bottles of hand sanitiser, 462 thermometers and 924 packets of masks were collected in a fund raising activity for needy families. The items were packed into gift bags for each family. Each gift bag has the same number of bottles of hand sanitizer, thermometers and packets of masks.

**(a)** Find the greatest number of gift bags packed.

*Answer (a)* ..... bags [3]

**(b)** Find the number of bottles of hand sanitisers, thermometers and packets of masks in each gift bag.

*Answer (b)* ..... bottles of hand sanitiser
..... thermometers
..... packets of masks [2]

---

**5.** Evaluate $-5^2-[1-12\div(-2)^2]+(-1)^3$.
Show your working steps clearly.

*Answer* ..... [3]

---

**6.** **(a)** Expand and simplify $2(4x-5y)-3(1-2y)$.

*Answer (a)* ..... [2]

**(b)** Express $\frac{4m+3}{6}+\frac{(m-1)}{2}$ as a single fraction.

*Answer (b)* ..... [3]

**(c)** Given the formula $v=\sqrt{u^2+2as}$, find the value of $v$ when $u = 12$, $a = 9$ and $s = 10$.

*Answer (c)* $v =$ ..... [2]

7. Factorise the following expressions completely.

**(a)** $5x^2 - 10x$

*Answer (a)* ..... [1]

**(b)** $b(b-3) - 2a(3-b)$

*Answer (b)* ..... [2]

---

8. Solve the following equations.

**(a)** $2(5a+1) - 3(a+2) = 0$

*Answer (a)* $a =$ ..... [2]

**(b)** $\frac{2x+1}{6} + \frac{x+7}{5} = 12$

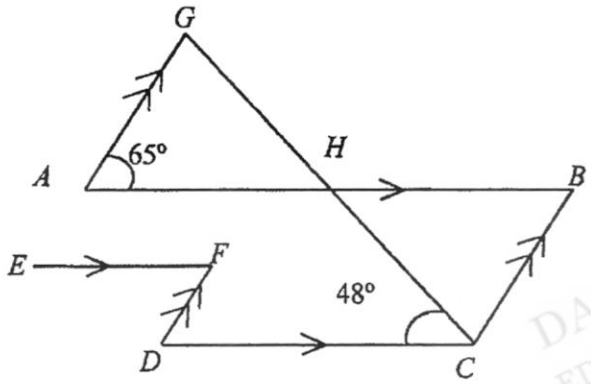
*Answer (b)* $x =$ ..... [3]

---

**9.** Joan measured an interior angle of a regular polygon to be 152.5°.
Billy knows immediately that the angle has been measured incorrectly.
Explain, with clear working steps, why Billy knows that Joan's measurement was incorrect.

*Answer* [3]

**10.** In the diagram, $AB \parallel DC \parallel EF$ and $AG \parallel DF \parallel CB$. $\angle GAH = 65°$ and $\angle DCH = 48°$.
Calculate




**(a)** $\angle AGH$,

*Answer (a)* $\angle AGH =$ ..... ° [2]

**(b)** $\angle GCB$,

*Answer (b)* $\angle GCB =$ ..... ° [2]

**(c)** reflex $\angle EFD$.

*Answer (c)* Reflex $\angle EFD =$ ..... ° [3]

**11.** In a rhombus $WXYZ$, $WX$ is 6 cm and $\angle WXY = 105°$.

**(a)** Using only a ruler, protractor and compasses, construct the rhombus $WXYZ$. Point $W$ has been given below.

*Answer (a)* [3]



•
$W$

**(b)** Measure the length of $WY$.

*Answer (b)* $WY =$ ..... cm [1]

**(c)** State the order of rotational symmetry of rhombus $WXYZ$.

*Answer (c)* ..... [1]

**(d)** Sandy claims that all rhombuses are parallelograms, but not all parallelograms are rhombuses. Do you agree? Explain your answer.

*Answer (d)* I .....because.....

.....

.....

..... [2]

**12.** Nora deposits \$8000 in Bank *A* at a simple interest of 1.2% per annum for 18 months. Lisa deposits the same amount in Bank *B* at a simple interest of *r*% per annum. After 18 months, Lisa's total interest amount is \$30 more than Nora's total interest.

(a) Find the value of *r*.



*Answer (a)* $r =$ ..... [3]

(b) Find the total amount that Lisa will have in Bank *B* after 5 years.

*Answer (b)* \$ ..... [2]

---

**End of Section A**

中正中学 义顺

CHUNG CHENG HIGH SCHOOL (YISHUN)

E

# 2020 End-Of-Year Examination

## Secondary One Express

CANDIDATE NAME

CLASS

INDEX NUMBER

# MATHEMATICS

7 October 2020

**Section B**

Additional Materials: 1 sheet of graph paper

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Answer **all** questions in Section A and Section B. **You are advised to spend not more than 1 hour in each section.**

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At the end of the examination, attach the graph paper behind this section.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this section is 48.

| For Examiner's Use |
| --- |
| / 48 |

Setter: Isma Wati Sidik

**1.** On a particular day, the exchange rates of Singapore dollars (SGD), US dollars (USD) and New Zealand dollars (NZD) is shown below:

1 SGD = 0.72547 USD  1 NZD = 0.65409 USD

**(a)** Find the exchange rate between Singapore dollars and New Zealand dollars in SGD/NZD, giving your answer correct to 3 decimal places.

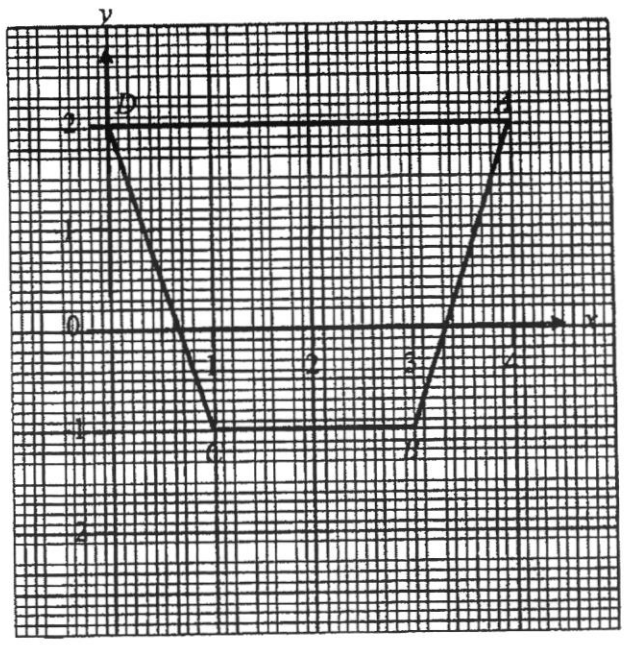


*Answer (a)* ..... SGD/NZD [2]

**(b)** A limited edition bag is sold in New Zealand for 845 NZD. On an online store, the same bag is sold for 540 USD. Which is a better deal? Justify your answer with clear working.

*Answer (b)* [2]

**2.** Lines $AB$, $BC$, $CD$ and $DA$ form a quadrilateral.




**(a)** Find the gradient of $CD$.

*Answer (a)* Gradient of $CD$ = ..... [2]

**(b)** State the equation of line $AD$.

*Answer (b)* ..... [1]

**(c)** Find the area of the quadrilateral $ABCD$.

*Answer (c)* ..... units$^2$ [2]

**3.** The ratio of $A : B$ is 0.5 : 0.04 and the ratio of $B : C$ is 6 : 5.
Find the ratio of $A : B : C$.



*Answer* $A : B : C =$ .... : .... : .... [3]

**4.** Joseph is 2 years younger than Kelly now. Let the present age of Joseph be $y$ years old.

**(a)** Express, in terms of $y$, Kelly's age 5 years ago.

*Answer (a)* .....years old [1]

**(b)** 5 years ago, Joseph was $\frac{2}{3}$ times the age of Kelly.

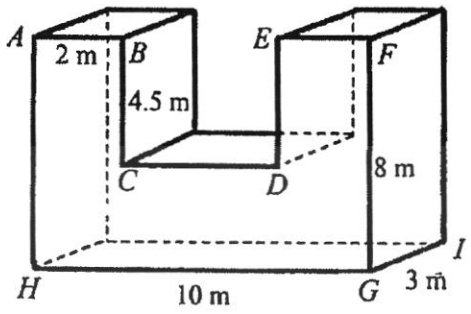
Write down an equation in terms of $y$.

*Answer (b)* ..... [1]

**(c)** Solve the equation in **(b)** to find Kelly's present age.

*Answer (c)* .....years old [3]

**5.** Water is filled into an empty container, with a uniform cross-section *ABCDEFGH*.
$BC = DE = 4.5$ m, $AB = EF = 2$ m, FG = 8 m, $GH = 10$ m and $GI = 3$ m.



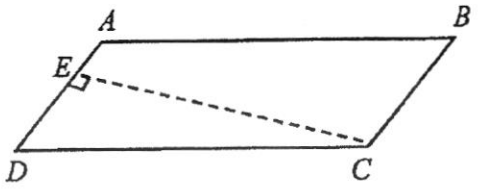

**(a)** Find the volume of the container.

*Answer (a)* ..... $m^3$ [2]

**(b)** Find the height of the water level in the container if 125 $m^3$ of water is poured into it. Give your answer correct to 1 decimal place.

*Answer (b)* ..... m [3]

**6.** A backyard is in the shape of parallelogram *ABCD*. The two sides of the parallelogram, *AB* and *BC* is in the ratio 3:1. The area and perimeter of the parallelogram *ABCD*, is 60 $m^2$ and 40 m respectively.




**(a)** Find the length of *AB*.

*Answer (a)* .....m [2]

**(b)** Find the length of *CE*.

*Answer (b)* .....m [1]

**(c)** The cost of planting synthetic grass on the backyard is \$63.40 for 200 $cm^2$. Find the total cost of covering the backyard with the synthetic grass.

*Answer (c)* \$ ..... [3]

7. A cylindrical pipe has an internal diameter of 5 cm. The thickness of the top rim of the pipe is 0.6 cm. The height of the pipe is 7 cm.

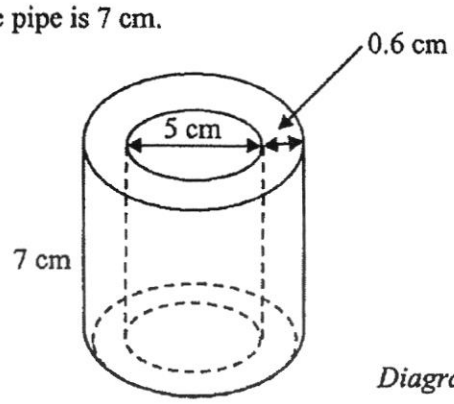



*Diagram is not drawn to scale.*

**(a)** Find the surface area of the top rim of the cylindrical pipe in terms of $\pi$.

*Answer (a)* ..... $cm^2$ [2]

**(b)** Find the external lateral surface area of the pipe in terms of $\pi$.

*Answer (b)* ..... $cm^2$ [2]

**(c)** Find the total surface area of the pipe correct to 3 significant figures.

*Answer (c)* ..... $cm^2$ [3]

8. Mariam receives \$240 for pocket money at the beginning of each month. The amount of pocket money, \$$y$ after $x$ days follows the equation, $y = -8x + 240$.

The table below shows some values of $x$ and $y$.

| $x$ | 0 | 10 | 20 | 30 |
|---|---|---|---|---|
| $y$ | 240 | $p$ | 80 | 0 |

**(a)** Calculate the value of $p$.

*Answer (a)* $p =$ ..... [1]

**(b)** Using a scale of 2 cm to represent 5 days, draw a horizontal axis for $0 \le x \le 30$.
Using a scale of 2 cm to represent \$50, draw a vertical axis for $0 \le y \le 250$.
On your axes, plot the points given in the table above and join them using a straight line. [4]

**(c)** Explain what $-8$ in the equation represents.

*Answer (c)* ..... [1]

**(d)** From the graph, find the amount of money Mariam has after 18 days.

*Answer (d)* \$ ..... [1]

**(e)** Use your graph to find how long it will take Mariam to spend all her pocket money.

*Answer (e)* ..... days [1]

9. It was reported that Singapore uses approximately 1760 million plastic items a year or almost one plastic item per person per day. However, less than 20% of the used plastic items were recycled.

A research also found that Singapore uses 467 million PET bottles a year.

**(a)** Find the percentage of PET bottles used in a year to the total number of plastic items used in a year.

*Answer (a)* ..... % [2]

**(b)** Singapore's population in 2019 is reported to be approximately 5.7 million. Do you agree with the statement, 'Singapore uses approximately 1760 million plastic items a year or almost one plastic item per person per day'? Explain your answer.

*Answer (b)*

[3]

**End of Section B**

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CHUNG CHENG HIGH SCHOOL (YISHUN)

E

# 2020 End-Of-Year Examination

## Secondary One Express

CANDIDATE NAME: MARKING SCHEME

CLASS: ____ ____ INDEX NUMBER: ____ ____

# MATHEMATICS

7 October 2020

**Section A**

2 hours

Additional Materials: NIL

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| For Examiner's Use | |
|---|---|
| Section A | / 52 |
| Section B | / 48 |
| Total | / 100 |

Setter: Isma Wati Sidik

**1.** Use your calculator to evaluate $\dfrac{655.998\times(8.0498)^2}{\sqrt{2}}$.

**(a)** Give your answer correct to two significant figures.

*Answer (a)* 30 000 — B1 [1]

**(b)** Give your answer correct to two decimal places.

*Answer (b)* 30 057.84 — B1 [1]

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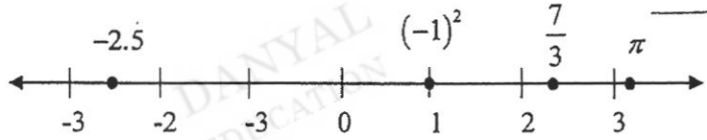
**2.** Represent the following numbers on the number line provided in the answer space.

$$\frac{7}{3},\ (-1)^2,\ \pi,\ (-1)^2$$

*Answer:*




D2

*Deduct 1 mark for each mistake.* [2]

---

**3.** **(a)** Express 1715 as a product of its prime factors in index notation.

| | |
|---|---|
| 5 | 1715 |
| 7 | 343 |
| 7 | 49 |
| 7 | 7 |
| | 1 |

M1

*Accept other suitable methods.*

*Answer (a)* $1715=5\times7^3$ — A1 [2]

---

**(b)** A square has an area of integer value, $(1715p)\text{cm}^2$. Write down the smallest possible integer value of $p$.

$p=5\times7=35$

*Answer (b)* $p=35$ — B1 [1]

---

**4.** 1155 bottles of hand sanitiser, 462 thermometers and 924 packets of masks were collected in a fund raising activity for needy families. The items were packed into gift bags for each family. Each gift bag has the same number of bottles of hand sanitizer, thermometers and packets of masks.

**(a)** Find the greatest number of gift bags packed.

| | |
|---|---|
| 3 | 1155, 462, 924 |
| 7 | 385, 154, 308 |
| 11 | 55, 22, 44 |
| | 5, 2, 4 |

M1

$HCF = 3 \times 7 \times 11$ — M1

$= 231$

*Answer (a)* 231 bags — A1 [3]

**(b)** Find the number of bottles of hand sanitisers, thermometers and packets of masks in each gift bag.

*Answer (b)* 5 bottles of hand sanitiser
2 thermometers — B2
4 packets of masks [2]

*Deduct 1 mark for each incorrect answer. Maximum -2.*

---

**5.** Evaluate $-5^2 - [1 - 12 \div (-2)^2] + (-1)^3$.

Show your working steps clearly.

$-5^2 - \left[1 - 12 \div (-2)^2\right] + (-1)^3$

$= -25 - (1 - 12 \div 4) - 1$ — M1 – evaluate powers

$= -25 - (1 - 3) - 1$ — M1 – $-12 \div 4$

$= -25 + 2 - 1$

$= -24$

*Answer* -24 (A1) [3]

---

**6.** **(a)** Expand and simplify $2(4x-5y)-3(1-2y)$.

$2(4x-5y)-3(1-2y)$
$=8x-10y-3+6y$ ——— M1
$=8x-4y-3$ ——— A1

*Answer (a)* 8x-4y-3 [2]

**(b)** Express $\frac{4m+3}{6}+\frac{(m-1)}{2}$ as a single fraction.

$\frac{4m+3}{6}+\frac{(m-1)}{2}$
$=\frac{4m+3+3(m-1)}{6}$ ——— M1
$=\frac{4m+3+3m-3}{6}$ ——— M1
$=\frac{7m}{6}$ ——— A1

*Answer (b)* $\frac{7m}{6}$ [3]

**(c)** Given the formula $v=\sqrt{u^2+2as}$, find the value of $v$ when $u=12$, $a=9$ and $s=10$.

$v=\sqrt{u^2+2as}$
$v=\sqrt{12^2+2(9)(10)}$ ——— M1
$v=\sqrt{144+180}$
$v=18$ ——— A1

*Answer (c)* $v=18$ [2]

7. Factorise the following expressions completely.

**(a)** $5x^2-10x$

$5x^2-10x=5x(x-2)$ — B1

*Answer (a)* $\underline{5x(x-2)}$ [1]

**(b)** $b(b-3)-2a(3-b)$

$b(b-3)-2a(3-b)$
$=b(b-3)+2a(b-3)$ — M1
$=(b-3)(b+2a)$ — A1

*Answer (b)* $\underline{(b-3)(b+2a)}$ [2]

---

8. Solve the following equations.

**(a)** $2(5a+1)-3(a+2)=0$
$10a+2-3a-6=0$ — M1
$7a=-2+6$
$7a=4$
$a=\frac{4}{7}$ — A1

*Answer (a)* $\underline{a=\frac{4}{7}}$ [2]

**(b)** $\frac{2x+1}{6}+\frac{x+7}{5}=12$
$\frac{5(2x+1)+6(x+7)}{30}=\frac{12\times30}{30}$ — M1
$10x+5+6x+42=360$
$16x=360-47$ — M1
$x=\frac{313}{16}$
$x=19\frac{9}{16}$ — A1

*Answer (b)* $x=19\frac{9}{16}$ [3]

---

9. Joan measured an interior angle of a regular polygon to be 152.5°.
Billy knows immediately that the angle has been measured incorrectly.
Explain, with clear working steps, why Billy knows that Joan's measurement was incorrect.

*Answer* [3]

Size of one exterior angle $= 180° - 152.5°$ (adjacent angles on a straight line)

$= 27.5°$ — M1

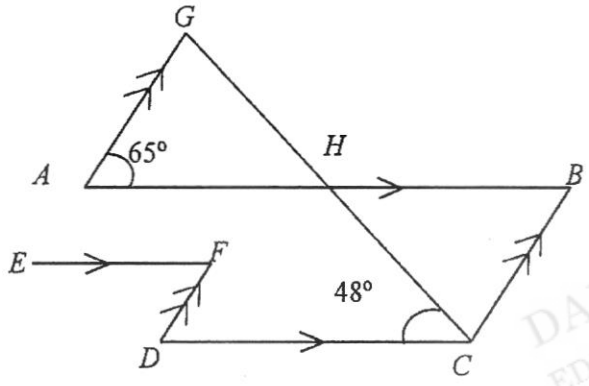
Sum of exterior angles of a polygon = 360°.

Number of sides of the polygon, $n = \frac{360°}{27.5°}$ — M1

$= 13\frac{1}{3}$

Since the value of $n$ is not a whole number (accept positive integer), the measurement is incorrect. — R1

**10.** In the diagram, $AB$ // $DC$ // $EF$ and $AG$ // $DF$ // $CB$. $\angle GAH = 65°$ and $\angle DCH = 48°$. Calculate




**(a)** $\angle AGH$,

$\angle BHC = 48°$ (alternate angles, $HB$ // DC ) ——— M1

$\angle GHA = 48°$ (vertically opposite angles)

$\angle AGH = 180° - 65° - 48°$ (angle sum of a $\Delta$)

$= 67°$ ——— A1

*Answer (a)* $\angle AGH = \underline{67°}$ [2]

**(b)** $\angle GCB = \angle AGC$ (alternate angles, $AG$ // $CB$) ——— M1

$= 67°$ ——— A1

*Answer (b)* $\angle GCB = \underline{67°}$ [2]

**(c)** reflex $\angle EFD$.

$\angle BCD = 48° + 67°$

$= 115°$

$\angle FDC = 180° - 115°$ (interior angles, $FD$ // BC) ——— M1

$= 65°$

$\angle EFD = 65°$ (alternate angles, EF // DC) ——— M1

Reflex $\angle EFD = 360° - 65°$ (angles at a point)

$= 295°$ ——— A1

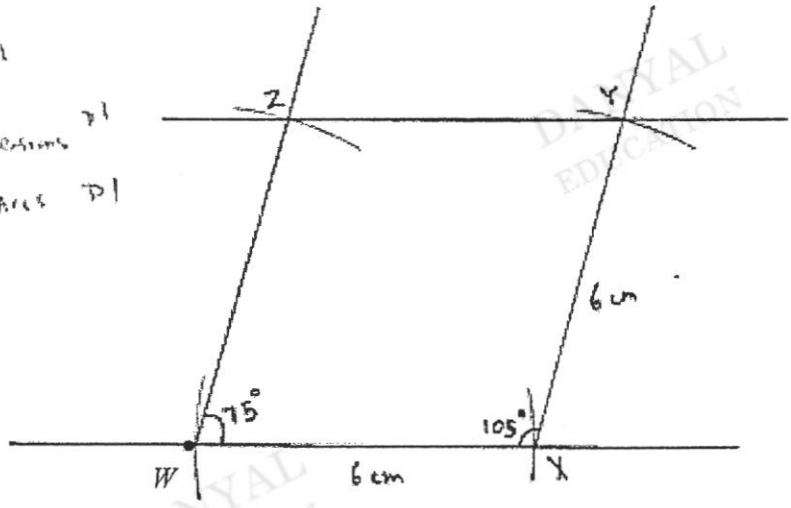
*Answer (c)* Reflex $\angle EFD = \underline{295°}$ [3]

**11.** In a rhombus $WXYZ$, $WX$ is 6 cm and $\angle WXY = 105°$.

**(a)** Using only a ruler, protractor and compasses, construct the rhombus $WXYZ$. Point $W$ has been given below.

*Answer (a)* [3]

Shape P1
Labels for points & Lines P1
Construction Arcs P1




**(b)** Measure the length of $WY$.

*Answer (b)* $WY = 9.5(\pm 0.1)$ cm — B1 [1]

**(c)** State the order of rotational symmetry of rhombus $WXYZ$.

*Answer (c)* 2 — B1 [1]

**(d)** Sandy claims that all rhombuses are parallelograms, but not all parallelograms are rhombuses. Do you agree? Explain your answer.

*Answer (d)* I agree — R1 because (rhombuses have all the properties of parallelograms, but some parallelograms have only a pair of opposite sides of equal lengths, but rhombuses have all the four equal sides). — R1

Accept any other correct reason such as diagonals do not bisect each other on a //gram. [2]

**12.** Nora deposits \$8000 in Bank *A* at a simple interest of 1.2% per annum for 18 months. Lisa deposits the same amount in Bank *B* at a simple interest of *r*% per annum. After 18 months, Lisa's total interest amount is \$30 more than Nora's total interest.

(a) Find the value of *r*.

Interest earnes by Nora $= \$8000 \times \frac{1.2}{100} \times \frac{18}{12}$

$= \$144$ ——— M1

Interest earned by Lisa $= \$144 + \$30$

$= \$174$

$8000 \times \frac{r}{100} \times \frac{18}{12} = 174$ ——— M1

$120r = 174$

$r = \frac{174}{120}$

$r = 1.45$ ——— A1

*Answer (a)* $r = 1.45$ [3]

(b) Find the total amount that Lisa will have in Bank *B* after 5 years.

Total amount of money Lisa has after 5 years

$= \$8000 \times \frac{1.45}{100} \times 5 + \$8000$ ——— M1

$= \$8580$ ——— A1

*Answer (b)* \$8580 [2]

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**End of Section A**

中正中学 义顺

CHUNG CHENG HIGH SCHOOL (YISHUN)

E

# 2020 End-Of-Year Examination
## Secondary One Express

CANDIDATE NAME: MARKING SCHEME

CLASS: ____ ____ INDEX NUMBER: ____ ____

# MATHEMATICS

7 October 2020

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At the end of the examination, attach the graph paper behind this section.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this section is 48.

| For Examiner's Use |
| --- |
| / 48 |

Setter: Isma Wati Sidik

**1.** On a particular day, the exchange rates of Singapore dollars (SGD), US dollars (USD) and New Zealand dollars (NZD) is shown below:

1 SGD = 0.72547 USD  1 NZD = 0.65409 USD

**(a)** Find the exchange rate between Singapore dollars and New Zealand dollars in SGD/NZD, giving your answer correct to 3 decimal places.

$1\ SGD = 0.72547\ USD$

$\frac{1}{0.72547}\ SGD = 1\ USD$

$1\ NZD = 0.65409 \times \frac{1}{0.72547}\ SGD$ ——— M1

$\approx 0.901609\ SGD$

$= 0.902\ SGD\ (3d.p)$ ——— A1

*Answer (a)* <u>0.902 SGD/NZD</u> [2]

**(b)** A limited edition bag is sold in New Zealand for 845 NZD. On an online store, the same bag is sold for 540 USD. Which is a better deal? Justify your answer with clear working.

*Answer (b)*

1 NZD = 0.65409 USD

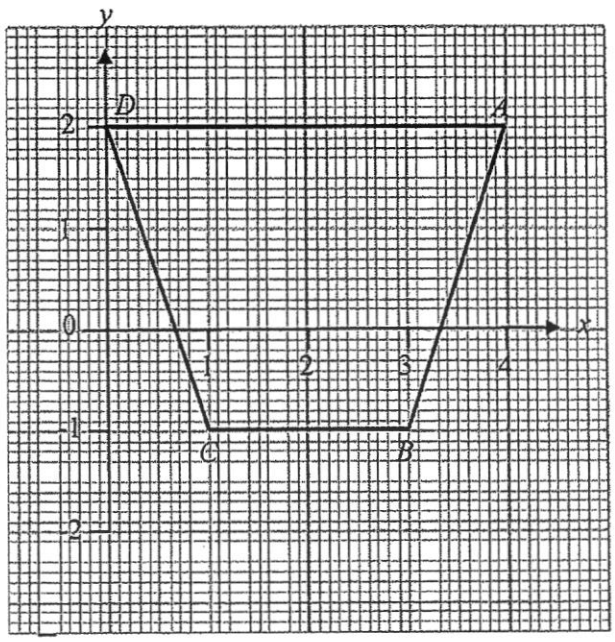
845 NZD = 845 × 0.65409 USD

= 552.70605 USD

= 552.71 USD (2 d.p) ——— M1

The bag sold online is a better deal than the one sold in New Zealand. ——— A1

**2.** Lines $AB$, $BC$, $CD$ and $DA$ form a quadrilateral.




**(a)** Find the gradient of $CD$.

Gradient of $CD = \dfrac{-3}{1}$ — M1

$= -3$ — A1

*Answer (a)* Gradient of $CD =$ $-3$ [2]

**(b)** State the equation of line $AD$.

*Answer (b)* $y = 2$ — B1 [1]

**(c)** Find the area of the quadrilateral $ABCD$.

Area of $ABCD = \dfrac{1}{2} \times (2+4) \times 3$ units$^2$ — M1

$= 9$ units$^2$ — A1

*Answer (c)* 9 units$^2$ [2]

**3.** The ratio of $A : B$ is 0.5 : 0.04 and the ratio of $B : C$ is 6 : 5.
Find the ratio of $A : B : C$.

$A : B$
$= 0.5 : 0.04$
$= 50 : 4$ — M1
$= 50 \times 3 : 4 \times 3$
$= 150 : 12$

$B : C$
$= 6 : 5$
$= 2 \times 6 : 2 \times 5$
$= 12 : 10$ — M1

$A : B : C$
$= 150 : 12 : 10$
$= 75 : 6 : 5$ — A1

*Answer* $\underline{A : B : C = 75 : 6 : 5}$ [3]

**4.** Joseph is 2 years younger than Kelly now. Let the present age of Joseph be $y$ years old.

**(a)** Express, in terms of $y$, Kelly's age 5 years ago.

$y + 2 - 5 = y - 3$

B1

*Answer (a)* $(y-3)$ years old [1]

**(b)** 5 years ago, Joseph was $\frac{2}{3}$ times the age of Kelly.

Write down an equation in terms of $y$.

$y-5=\frac{2}{3}(y-3)$ B1

*Answer (b)* $y-5=\frac{2}{3}(y-3)$ [1]

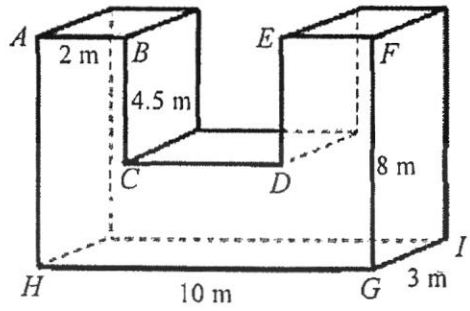
**(c)** Solve the equation in **(b)** to find Kelly's present age.

$3(y-5)=2(y-3)$
$3y-15=2y-6$
$3y-2y=15-6$
$y=9$ M1

Kelly's present age = (9+2) years old
= 11 years old. A1

*Answer (c)* 11 years old [3]

**5.** Water is filled into an empty container, with a uniform cross-section *ABCDEFGH*. $BC = DE = 4.5$ m, $AB = EF = 2$ m, FG = 8 m, $GH = 10$ m and $GI = 3$ m.




**(a)** Find the volume of the container.

Base area $= \left[(10\times3.5)+2(4.5\times2)\right] \text{m}^2$

$= 53 \text{ m}^2$

Volume of container $= (53 \times 3) \text{ cm}^2$ — M1

$= 159 \text{ m}^2$ — A1

*Answer (a)* 159 m$^3$ [2]

**(b)** Find the height of the water level in the container if 125 m$^3$ of water is poured into it. Give your answer correct to 1 decimal place.

Volume of water at level *CD* $= (10 \times 3 \times 3.5) \text{ m}^3$

$= 105 \text{ m}^3$ — M1

Height of water level above level *CD*

$= \dfrac{125-105}{(2\times3\times2)}$ m — M1

$= 1\dfrac{2}{3}$ m

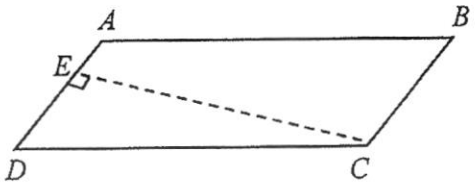
Total height $= \left(3.5+1\dfrac{2}{3}\right)$ m

$\approx 5.1666$ m

$= 5.2$ m (1 d.p) — A1

*Answer (b)* 5.2 m [3]

**6.** A backyard is in the shape of parallelogram $ABCD$. The two sides of the parallelogram, $AB$ and $BC$ is in the ratio 3:1. The area and perimeter of the parallelogram $ABCD$, is 60 $m^2$ and 40 m respectively.




**(a)** Find the length of $AB$.

$AB = \left(\frac{3}{4} \times \frac{40}{2}\right)$ m — M1

$= 15$ m — A1

**OR**

$3u + 3u + 1u + 1u = 8u$

8 units – 40

1 unit – 5

3 units - $5m \times 3$

$= 15$ m

*Answer (a)* 15 .m [2]

**(b)** Find the length of $CE$.

$CE = \frac{60}{20-15} m$

$CE = 12m$ — B1

OR

Area of parallelogram = base × perpendicular height

$60 = 5 \times h$

$h = \frac{60}{5}$

$h = 12$

*Answer (b)* 12.m [1]

**(c)** The cost of planting synthetic grass on the backyard is \$63.40 for 200 $cm^2$. Find the total cost of covering the backyard with the synthetic grass.

$$\text{Total cost} = \frac{\$63.40}{200} \times (60 \times 100 \times 100)$$

M1

M1 for conversion

\$190 200 — A1

**OR**

$60m^2 = (60 \times 100 \times 100)cm^2$

$60m^2 = 600000cm^2$

$200cm^2$ – \$63.40

$1cm^2$ – $\frac{\$63.40}{200}$

$600000cm^3$ – $\frac{\$63.40}{200} \times 600000$

– \$190200

*Answer (c)* \$ 190 200 [3]

7. A cylindrical pipe has an internal diameter of 5 cm. The thickness of the top rim of the pipe is 0.6 cm. The height of the pipe is 7 cm.

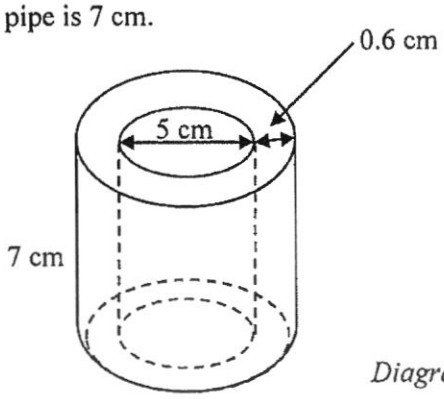



*Diagram is not drawn to scale.*

**(a)** Find the surface area of the top rim of the cylindrical pipe in terms of $\pi$.

Surface ares of top rim

$=\left[\pi\times(3.1)^2-\pi(2.5)^2\right]\text{cm}^2$ —— M1

$=3.36\pi\ \text{cm}^2$ —— A1

*Answer (a)* $3.36\pi\ \text{cm}^2$ [2]

**(b)** Find the external lateral surface area of the pipe in terms of $\pi$.

External lateral surface area

$=\left[2\pi\times(3.1)^2\times7\right]\ \text{cm}^2$ —— M1

$=43.4\pi\ \text{cm}^2$ —— A1

*Answer (b)* $43.4\pi\ \text{cm}^2$ [2]

**(c)** Find the total surface area of the pipe correct to 3 significant figures.

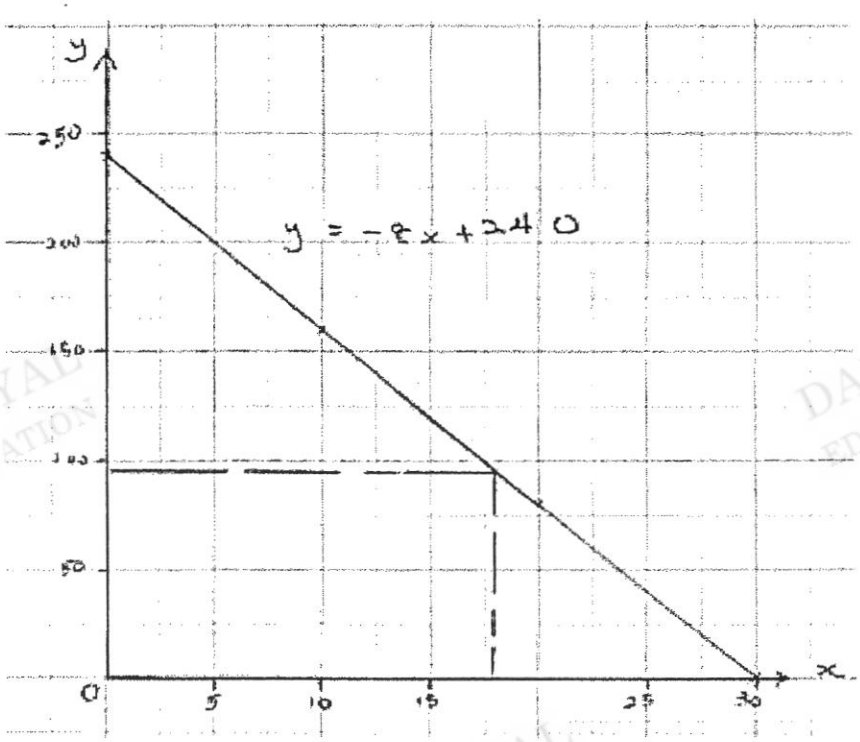
Total surface area —— M1

$=\left[(2\times3.36\pi)+43.4\pi+(2\pi\times2.5\times7)\right]\text{cm}^2$ —— M1

$\approx 256.8566\ \text{cm}^2$

$=257\ \text{cm}^2$ (3 s.f) —— A1

*Answer (c)* 257 cm$^2$ [3]




1 mark – scale

1 mark – points

1 mark – label

1 mark – straight line

8. Mariam receives \$240 for pocket money at the beginning of each month. The amount of pocket money, \$$y$ after $x$ days follows the equation, $y = -8x + 240$.

The table below shows some values of $x$ and $y$.

| $x$ | 0 | 10 | 20 | 30 |
|---|---|---|---|---|
| $y$ | 240 | $p$ | 80 | 0 |

**(a)** Calculate the value of $p$.

*Answer (a)* $p = \underline{160}$ — B1 [1]

**(b)** Using a scale of 2 cm to represent 5 days, draw a horizontal axis for $0 \le x \le 30$.
Using a scale of 2 cm to represent \$50, draw a vertical axis for $0 \le y \le 250$.
On your axes, plot the points given in the table above and join them using a straight line. [4]

**(c)** Explain what $-8$ in the equation represents.

*Answer (c)* – 8 is the amout of pocket money spent in a day. — B1 [1]

**(d)** From the graph, find the amount of money Mariam has after 18 days.

*Answer (d)* \$95 — B1 [1]

**(e)** Use your graph to find how long it will take Mariam to spend all her pocket money.

*Answer (e)* 30 days — B1 [1]

9. It was reported that Singapore uses approximately 1760 million plastic items a year or almost one plastic item per person per day. However, less than 20% of the used plastic items were recycled.

A research also found that Singapore uses 467 million PET bottles a year.

**(a)** Find the percentage of PET bottles used in a year to the total number of plastic items used in a year.

$\frac{467\ million}{1760\ million} \times 100\ \%$ —— M1

$\approx 26.53409\ \%$

$=26.5\ \%$ (3 s.f) —— A1

*Answer (a)* 26.5 % [2]

**(b)** Singapore's population in 2019 is reported to be approximately 5.7 million. Do you agree with the statement, 'Singapore uses approximately 1760 million plastic items a year or almost one plastic item per person per day'? Explain your answer.

*Answer (b)*

[3]

$\frac{1760\ million}{5.7\ million} \div 365$ —— M1

$\approx 0.84595$

$=1$ (1 s.f) —— M1

I agree with the statement because when the answer is rounded up to 1 significant figure, it given the value of 1 plastic item per person per day. —— R1

$5.7 \times 365$

$= 2080.5 million$

$\approx 2000 million (1sf)$

$1760 million \approx 2000 milion (1sf)$

Conclusion: Yes I agree, when rounded off to 1 s.f the amount of plastic items used per year is equal

$5.7 \times 365$

$= 2080.5 million$

$\approx 2100 million (2sf)$

$1760 million \approx 1800 milion (1sf)$

Conclusion: I disagree, when rounded off to 2 s.f the difference is 300 million.

*-need to see the coherence of making conclusion based on the working done and the reason/s given.*



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**End of Section B**