Name: _____ ( ) Class: Sec _____

MATHEMATICS   4046/01

Paper 1   **10 MAY 2018**

1 hour 30 mins

READ THESE INSTRUCTIONS FIRST

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

Answer **all** questions.
The number of marks is given in brackets [ ] at the end of each question or part question.

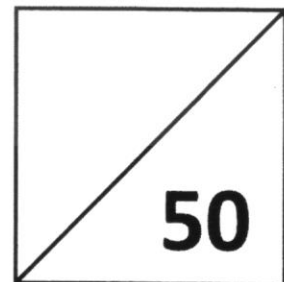If working is needed for any question it must be shown with the answer.
Omission of essential working will result in loss of marks.
The total number of marks for this paper is 50.

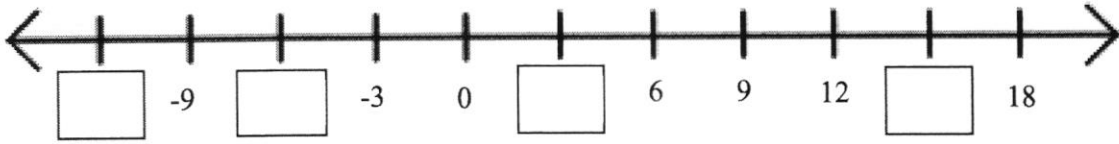The use of an approved scientific calculator is expected, where appropriate.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142.

50

Answer **all** the questions.

1   Complete the number line below by filling the missing blanks.   [2]

_____

2   Fill in the blanks with " < " , " > " or " = " to make the statement true.

(a) $4\frac{3}{4}$ _____ $4\frac{2}{3}$ [1]

(b)   -12 _____ -20   [1]

(c) $\sqrt{49} + 4$ _____ $-5 + 4^2$ [1]

_____

3   Round 35.537

(a)   to the nearest whole number,

                    Answer .... [1]

(b)   to 2 decimal places,

                    Answer .... [1]

(c)   to 1 significant figure.

                    Answer .... [1]

_____

4   Write down the algebraic expression for the following questions.

(a) Sum of $3b$ and 3

Answer ....[1]

(b) x times y then minus 2

Answer ....[1]

(c) $5 - g$ divided by the product of 3 and h

Answer ....[1]

---

5   Solve the following equations. Show your working clearly.

(a) $a + 3 = 5$

Answer ....[1]

(b) $5b = 30$

Answer ....[2]

---

6 Simplify the following expressions.

(a) $5a + 3 - a - 7$

Answer .... [1]

(b) $(b - 5) - (3 - 2b)$

Answer .... [2]

(c) $5c - \dfrac{3c}{5}$

Answer .... [2]
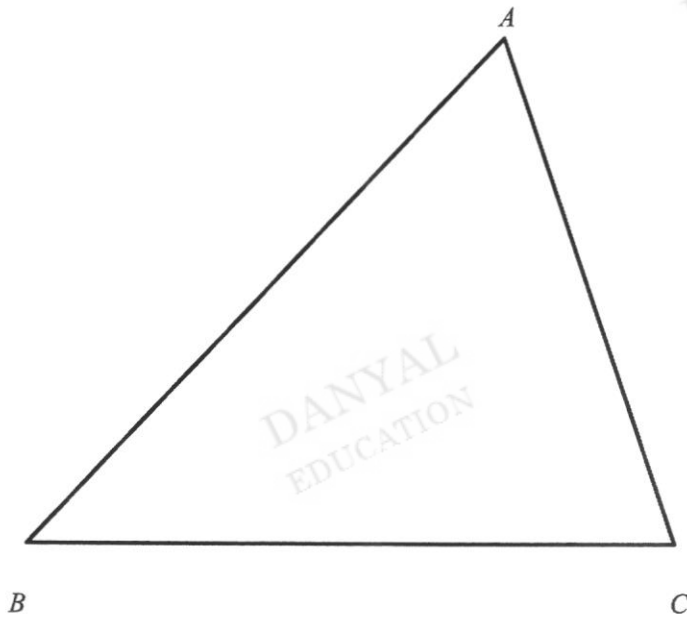
7   In the figure below,

(a)   Construct

(i)   the angle bisector of angle *ABC*,   [2]

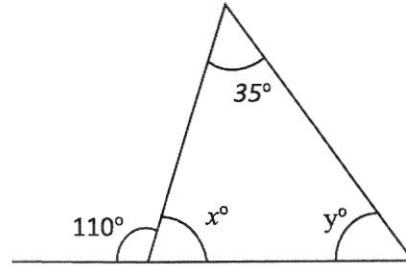(ii)   the perpendicular bisector of side *AB*.   [2]

(b)   The perpendicular bisector of side *AB* meets the angle bisector of angle *ABC* at point *X*.

(i)   Label the point *X* clearly.   [1]

(ii)   Measure the distance from *C* to point *X*.

Answer *CX* = ... cm [1]

8 By showing your working clearly, calculate the values of
(a) x,

Answer x = ... [2]

(b) y.

Answer y = ... [2]

---

9 In the figure below, *CDE* is a straight line parallel to *AB*.
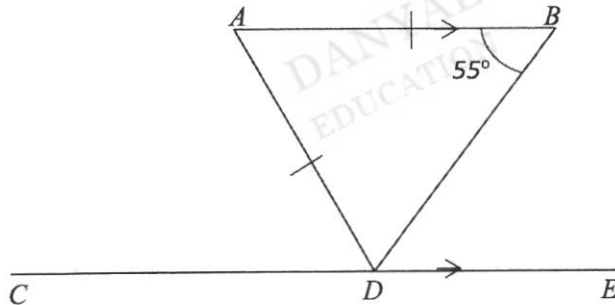
Find

(a) ∠*BDE*,

Answer ∠*BDE* = ...° [1]

(b) ∠*BDA*,

Answer ∠*BDA* = ...° [1]

(c) ∠*ADC*. Show your working clearly.

Answer ∠*ADC* = ...° [2]

10   In the figure below, *AB* is a straight line parallel to *CD*. By showing your working clearly, find

(a)   *p*,
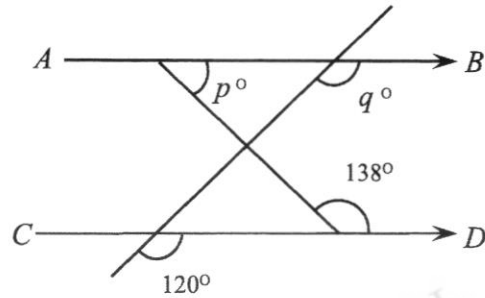
Answer p = ... [2]

(b)   *q*.

Answer q = ... [1]

11   Amos works in a restaurant from 1pm to 9pm each day and earns $4.20 per hour.

(a)   How much is he paid each day?

Answer $ .... [1]

(b)   Amos wants to buy a new pair of spectacles that costs $168. How many days must he work to earn enough to buy the spectacles?

Answer .... days [1]

12 In the office, Fiona can type 144 words in 3 minutes while Suzie can type 78 words per minute. Find

(a) Fiona's rate of typing in units of words/min,

Answer .... words/min [1]

(b) the number of words Suzie can type in 5.5 minutes

Answer .... words [1]

13 Sandy is x years old. Jovan is 3 years older than Sandy.

(a) Express Jovan's age in terms of x.

Answer .... [1]

(b) Express the sum of their ages in terms of x.

Answer .... [1]

(c) Given the sum of their ages is 27 years, form an equation involving the sum of their ages and solve the equation to find Sandy's age.

Answer .... years old [2]

14 In the diagram below, $\triangle PQR$ and $\triangle ABC$ are congruent.
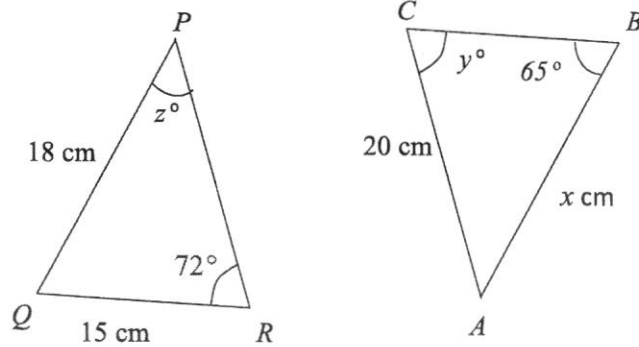
By showing your working clearly, find

(a) the value of x,

Answer x = ... [1]

(b) the value of y,

Answer y = ... [1]

(c) the value of z,

Answer z = ... [2]

(d) the perimeter of $\triangle PQR$.

Answer .... cm [2]

Name: _____ ( ) Class: Sec _____

MATHEMATICS

4046/02

Paper 2

10 MAY 2018

Candidates answer on the Question Paper.

1 hour 30 minutes

READ THESE INSTRUCTIONS FIRST

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Answer **all** questions.
The number of marks is given in brackets [ ] at the end of each question or part question.

If working is needed for any question it must be shown with the answer.
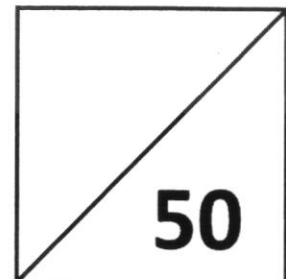Omission of essential working will result in loss of marks.
The total number of marks for this paper is 50.

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For π, use either your calculator value or 3.142.

50

This document consists of **10** printed pages.

Answer **all** the questions.

1 **(a)** Arrange the following in ascending order.

0.33 $\dfrac{5}{4}$ 1 65%

Answer .... [2]

(b) Use a calculator to evaluate the following.

(i) $33 + (2^3 - 4^2) \times 5$

Answer .... [1]

(ii) $\sqrt{144} + 18 \div \sqrt[3]{216}$

Answer .... [1]

(c) The ratio of the number of boys to the number of girls in a class is 3 : 4. If there are 15 boys in the class, what is the total number of students?

Answer .... students [2]

2   Simplify the following expressions.

(a) $3(2b) + b$

Answer .... [1]

(b) $4(4 + p) - 12$

Answer .... [2]

(c) $\dfrac{4r}{7} - \dfrac{r+1}{7}$

Answer .... [2]

(d) $\dfrac{5r}{2} + \dfrac{2(r-1)}{3}$

Answer .... [2]

3 If $a = 2$, $b = 3$ and $c = -4$, find the value of the following expressions.

(a) abc,

Answer .... [1]

(b) $c^2 - a^2$.

Answer .... [1]

4 Solve the following equations.

(a) $4a - 7 = 12$

Answer $a =$ .... [2]

(b) $2b - 1 = 6 + b$

Answer $b =$ .... [2]

(c) $5(2 + c) = 15$

Answer $c =$ .... [2]

5   The distance from Town A to a restaurant is 80 km and the distance from the restaurant to Town B is 100 km. Sarah drove her car from town A to the restaurant in 1 hour, had her lunch for 30 minutes and drove from the restaurant to Town B in 1 hour 30 minutes.

```
Town A              Restaurant              Town B
├──────────────────┼────────────────────────┤
        80 km                100 km
```
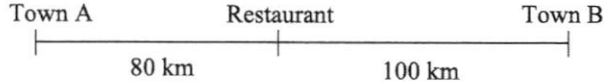
(a)   If she left Town A at 12 pm, what time did she arrive at Town B?

Answer .... [2]

(b)   Calculate her average speed for the whole journey in km/h.

Answer .... km/h [2]

(c)   Given that her car can travel 15 km per litre of petrol and if the cost of petrol is $1.50 per litre, find the cost of the petrol for her whole journey.

Answer $................................. [2]

6   On a certain day, the exchange rate between Singapore dollars (SGD) and US dollars (USD) is 1 USD = 1.25 SGD.

(a)   A watch costs 875 SGD, how much does the watch cost in USD?

Answer .... USD [2]

(b)   Jane has 1000 USD and she buys the watch mentioned in **part (a)**. She decides to change the remaining USD she has left to SGD. How much SGD will she get?

Answer .... SGD [3]

7 Construct a triangle ABC in which $AB = 9$ cm, $AC = 7$ cm and $\angle BAC = 55°$.
The line AB has been drawn for you. [3]

Measure

(a) BC,
(b) $\angle ACB$.

_A_ _____ _B_

Answer $BC =$ .... cm [1]

Answer $\angle ACB =$ .... ° [1]

8   Construct a parallelogram *WXYZ* in which *WX=8* cm, *XY=* 6 cm and $\angle$ *WXY* = 120 °. The line *WX* has been drawn for you.   [3]

Measure the length of *WY*.

W _____ X

Answer WY = ... cm [1]

9 Given that triangle *CDE* is similar to triangle *XYZ*.

C

12 cm

120°   35°

D   10 cm   E

X

6 cm   a°

Y   *b* cm   Z
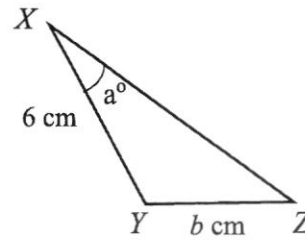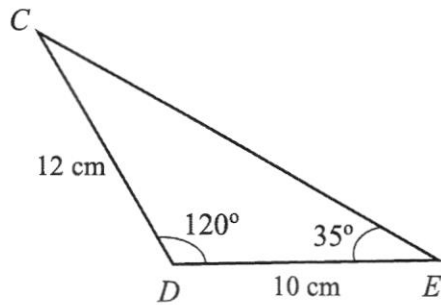
Find the value of

(a) *a*,

Answer ……………………... [2]

(b) *b*.

Answer ……………………... [2]

10 Given that quadrilateral *PQRS* is similar to quadrilateral *ABRC*.
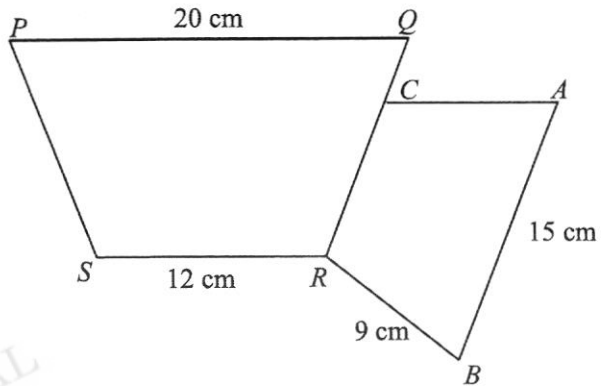
Find

(a) the length of *RC*,

Answer …………………….. cm [2]

(b) the length of *RQ*,

Answer …………………….. cm [2]

(c) the length of *CQ*.

Answer …………………….. cm [1]

End of Paper

CREST SECONDARY SCHOOL
MID-YEAR EXAMINATION
SECONDARY TWO NORMAL (TECHNICAL)

Name: _____ ( ) Class: Sec _____

MARK SCHEME
Paper 1

4046/01
10 MAY 2018

1 hour 30 mins

READ THESE INSTRUCTIONS FIRST

Write your name, index number and class on all the work you hand in.
Write in dark blue or black pen.
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Answer **all** questions.
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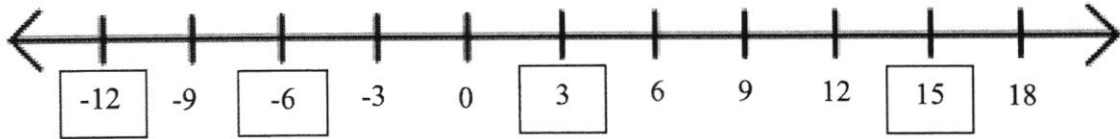For π, use either your calculator value or 3.142.

50

This document consists of **9** printed pages.

Answer **all** the questions.

1   Complete the number line below by filling the missing blanks.   [2]

| -12 | -9 | -6 | -3 | 0 | 3 | 6 | 9 | 12 | 15 | 18 |

Award 1 mark for every 2 correct answers.

---

2   Fill in the boxes with " $<$ ", " $>$ " or " $=$ " to make the statement true.

   (a) $4\frac{3}{4}$ $>$ $4\frac{2}{3}$ [B1]

   (b)   -12 $>$ -20   [B1]

   (c) $\sqrt{49} + 4$ $=$ $-5 + 4^2$ [B1]

---

3   Round 35.537

   (a)   to the nearest whole number,

                                                                 Answer 36 [B1]

   (b)   to 2 decimal places,

                                                              Answer 35.54 [B1]

   (c)   to 1 significant figure.

                                                                 Answer 40 [B1]

---

4   Write down the algebraic expression for the following questions.
    (a) Sum of 3b and 3

Ans: $3b + 3$ [B1]

(b) x times y then minus 2

Note: Award 1 mark for getting xy.

Ans: $xy - 2$ [B1]

(c) $5 - g$ divided by the product of 3 and h

Note: Award 1 mark for getting $3h$.

Ans: $\dfrac{5-g}{3h}$ [B1]

---

5   Solve the following equations. Show your working clearly.
    (a) $a + 3 = 5$
    $a = 5 - 3$

    $a = 2$

Ans: a=2 [B1]

(b) $5b = 30$
    $b = 30 \div 5$ [M1]

    $b = 6$ [A1]

Ans: $b = 6$ [2]

---

6 Simplify the following expressions.

(a) $5a + 3 - a - 7$

Ans: $4a - 4$ [B1]

(b) $(b - 5) - (3 - 2b)$

$= b - 5 - 3 + 2b$ [M1]
$= 3b - 8$ [A1]

Ans: $3b - 8$ [2]

(c) $5c - \frac{3c}{5}$

$= \frac{25c - 3c}{5}$ [M1]

$= \frac{22c}{5}$ or $4\frac{2}{5}c$ [A1]

Ans: $\frac{22c}{5}$ or $4\frac{2}{5}c$ [2]

7 In the figure below,

   (a) Construct

   (i)   the angle bisector of angle *ABC*,   [2]

   (ii) the perpendicular bisector of side *AB*.   [2]
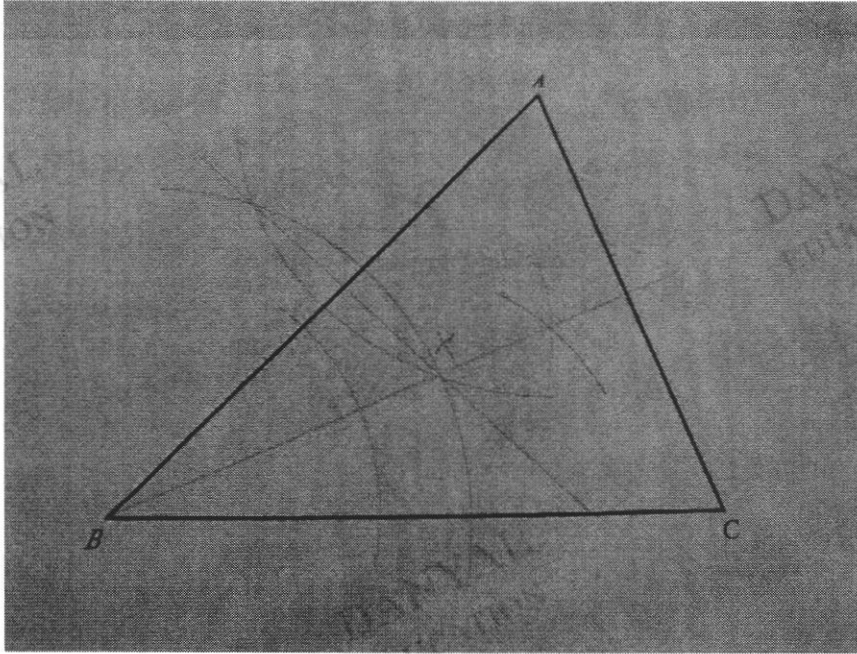
For both perpendicular and angle bisectors,

Award 1 m for curves

Award 1 m for lines

   (b) The perpendicular bisector of side *AB* meets the angle bisector of angle *ABC* at point *X*.

   (i)   Label the point *X* clearly.   [B1]

   (ii) Measure the distance from *C* to point *X*.

Answer *CX* = 4.7 ± 0.1 *cm* [B1]

8 By showing your working clearly, calculate the values of
   (a) x,
   $x = 180^o - 110^o$ [M1]
     $= 70^o$ [A1]

Ans: $x = 70$ [2]

(b) y.
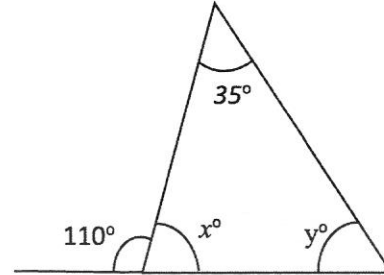
$y = 180^o - 70^o - 35^o$ [M1]
  $= 75^o$ [A1]

Ans: $y = 75$ [2]

---

9 In the figure below, CDE is a straight line parallel to AB.
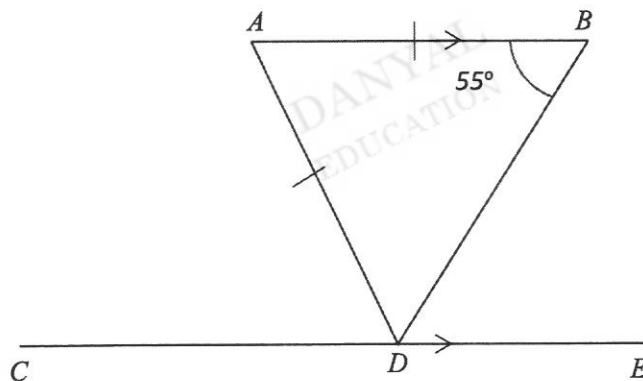
Find
   (a) $\angle BDE$,

Ans: $\angle BDE = 55^\circ$ [B1]

   (b) $\angle BDA$,

Ans: $\angle BDA = 55^\circ$ [B1]

   (c) $\angle ADC$. Show your working clearly.

$\angle ADC = 180^o - 55^o - 55^o$ [M1]
  $= 70^o$ [A1]

Ans: $\angle ADC = 70^\circ$ [2]

10 In the figure below, *AB* is a straight line parallel to *CD*. By showing your working clearly, find

(a) *p*,

$p = 180^\circ - 138^\circ$ [M1]

$= 42^\circ$ [A1]
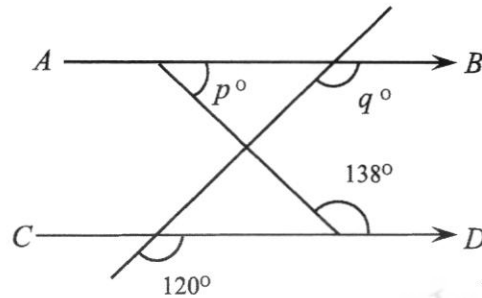
Ans: *p* = 42 [2]

(b) *q*.

Ans: *q* = 120 [B1]

---

11 Amos works in a restaurant from 1pm to 9pm each day and earns $4.20 per hour.

(a) How much is he paid each day?

$4.20 × 8

= $33.60

Ans: $ 33.60 [B1]

(b) Amos wants to buy a new pair of spectacles that costs $168. How many days must he work to earn enough to buy the spectacles?

$168 ÷ $33.60

= 5 days

Ans: 5 days [B1]

12 In the office, Fiona can type 144 words in 3 minutes while Suzie can type 78 words per minute. Find

(a) Fiona's rate of typing in units of words/min,

$144 \div 3$

$= 48$ words/min

Ans: 48 words/min [B1]

(b) the number of words Suzie can type in 5.5 minutes

78×5.5

$= 429\ words$

Ans: 429 words [B1]

13 Sandy is x years old. Jovan is 3 years older than Sandy.
(a) Express Jovan's age in terms of x.

$x+3$

Ans: $x+3$ [B1]

(b) Express the sum of their ages in terms of x.

$x + x + 3$

$= 2x+3$

Ans: $2x+3$ [B1]

(c) Given the sum of their ages is 27 years, form an equation involving the sum of their ages and solve the equation to find Sandy's age.

$2x + 3 = 27$ [M1]

$2x = 27 - 3$

$x = 24 \div 2$

$x = 12$ [A1]

Ans: 12 years old [2]

14 In the diagram below, $\triangle ABC$ and $\triangle PQR$ are congruent.
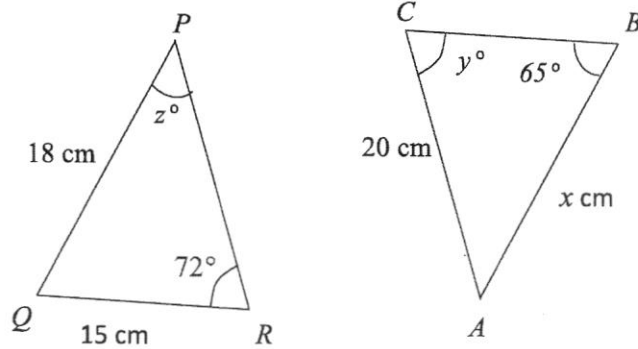
By showing your working clearly, find

(a) the value of x,

Ans: $x = 18$ [B1]

(b) the value of y,

Ans: $y = 72$ [B1]

(c) the value of z,

$$z = 180^o - 65^o - 72^o \text{ [M1]}$$

$$= 43^o \text{ [A1]}$$

Ans: $z = 43$ [2]

(d) the perimeter of $\triangle PQR$.

$$\text{Perimeter} = 18 + 15 + 20 \text{ [M1]}$$

$$= 53 \text{cm [A1]}$$

Ans: 53 cm [2]

Name: _____ (   ) Class: Sec _____

MARK SCHEME

Paper 2

Candidates answer on the Question Paper.

4046/02

10 MAY 2018

1 hour 30 minutes

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For π, use either your calculator value or 3.142.

50

This document consists of **10** printed pages.

Answer **all** the questions.

1 **(a)** Arrange the following in ascending order.

$$0.33 \qquad \frac{5}{4} \qquad 1 \qquad 65\%$$

Award 1 mark for every 2 consecutive correct answers.

Answer 0.33 , 65% , $1,$ $\dfrac{5}{4}$

[2]

(b) Use a calculator to evaluate the following.

(i) $33 + (2^3 - 4^2) \times 5$

Answer -7 [B1]

(ii) $\sqrt{144} + 18 \div \sqrt[3]{216}$

Answer 15 [B1]

(c) The ratio of the number of boys to the number of girls in a class is 3 : 4. If there are 15 boys in the class, what is the total number of students?

Total number of students $= \dfrac{7}{3} \times 15$ [M1]

$= 35$ students   [A1]

Answer 35 students [2]

2 Simplify the following expressions.

(a) $3(2b) + b$

$= 6b + b$
$= 7b$

Ans: $7b$ [B1]

(b) $4(4 + p) - 12$

$= 16 + 4p - 12$ [M1]
$= 4 + 4p$ [A1]

Ans: $4 + 4p$ [2]

(c) $\dfrac{4r}{7} - \dfrac{r+1}{7}$

$= \dfrac{4r-r-1}{7}$ [M1]

$= \dfrac{3r-1}{7}$ [A1]

Ans: $\dfrac{3r-1}{7}$ [2]

(d) $\dfrac{5r}{2} + \dfrac{2(r-1)}{3}$

$= \dfrac{15r+4(r-1)}{6}$ [M1]

$= \dfrac{15r+4r-4}{6}$

$= \dfrac{19r-4}{6}$ [A1]

Ans: $\dfrac{19r-4}{6}$ [2]

3. If $a = 2$, $b = 3$ and $c = -4$, find the value of the following expressions. Show your working clearly.

(a) abc,

$= (2)(3)(-4)$

$= -24$ [A1]

Ans: -24 [B1]

(b) $c^2 - a^2$.

$= (-4)^2 - 2^2$
$= 12$

Ans: 12 [B1]

---

4. Solve the following equations.

(a) $4a - 7 = 12$

$4a = 12 + 7$ [M1]

$a = 19 \div 4$

$a = 4\frac{3}{4}$ or $a = 4.75$ [A1]

Ans: $a = 4\frac{3}{4}$ or $a = 4.75$ [2]

(b) $2b - 1 = 6 + b$

$2b - b = 6 + 1$ [M1]

$b = 7$ [A1]

Ans: $b = 7$ [2]

(c) $5(2 + c) = 15$

$10 + 5c = 15$ [M1]

$5c = 15 - 10$
$5c = 5$

$c = 1$ [A1]

OR

$\frac{5(2+c)}{5} = \frac{15}{5}$

$2 + c = 3$ [M1]
$c = 1$ [A1]

Ans: $c = 1$ [2]

5   The distance from Town A to a restaurant is 80 km and the distance from the restaurant to Town B is 100 km. Sarah drove her car from town A to the restaurant in 1 hour, had her lunch for 30 minutes and drove from the restaurant to Town B in 1 hour 30 minutes.

```
Town A              Restaurant              Town B
  ├──────────────────────┼──────────────────────┤
          80 km                  100 km
```
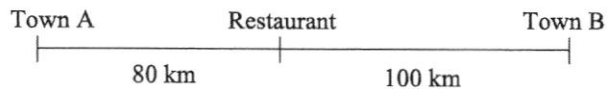
(a)   If she left Town A at 12 pm, what time did she arrive at Town B?

$1h + 30\,\text{min} + 1h\,30min = 3h$

12 pm + 3 hr [M1]
= 3 pm   [A1]

Ans: 3 pm [2]

(b)   Calculate her average speed for the whole journey in km/h.

$180 \div 3$ [M1]
$= 60\,\text{km/h}$ [A1]

Ans: 60 km/h [2]

(c)   Given that her car can travel 15 km per litre of petrol and if the cost of petrol is $1.50 per litre, find the cost of the petrol for her whole journey.

$180 \div 15$ [M1]
$= 12\,l$

$12\,l \times \$1.50$
$= \$18$ [A1]

Ans: $18 [2]

6 On a certain day, the exchange rate between Singapore dollars (SGD) and US dollars (USD) is 1 USD = 1.25 SGD.

(a) A watch costs 875 SGD, how much does the watch cost in USD?

875 ÷ 1.25   [M1]
= 700 USD   [A1]

Ans: 700 USD [2]

(b) Jane has 1000 USD and she buys the watch mentioned in **part (a)**. She decides to change the remaining USD she has left to SGD. How much SGD will she get?

1000 − 700   [M1]
= 300 USD

300 × 1.25   [M1]
= 375 SGD   [A1]

Ans: 375 SGD [3]

7 Construct a triangle ABC in which $AB = 9$ cm, $AC = 7$ cm and $\angle BAC = 55°$.
The line AB has been drawn for you.   [3]

Measure

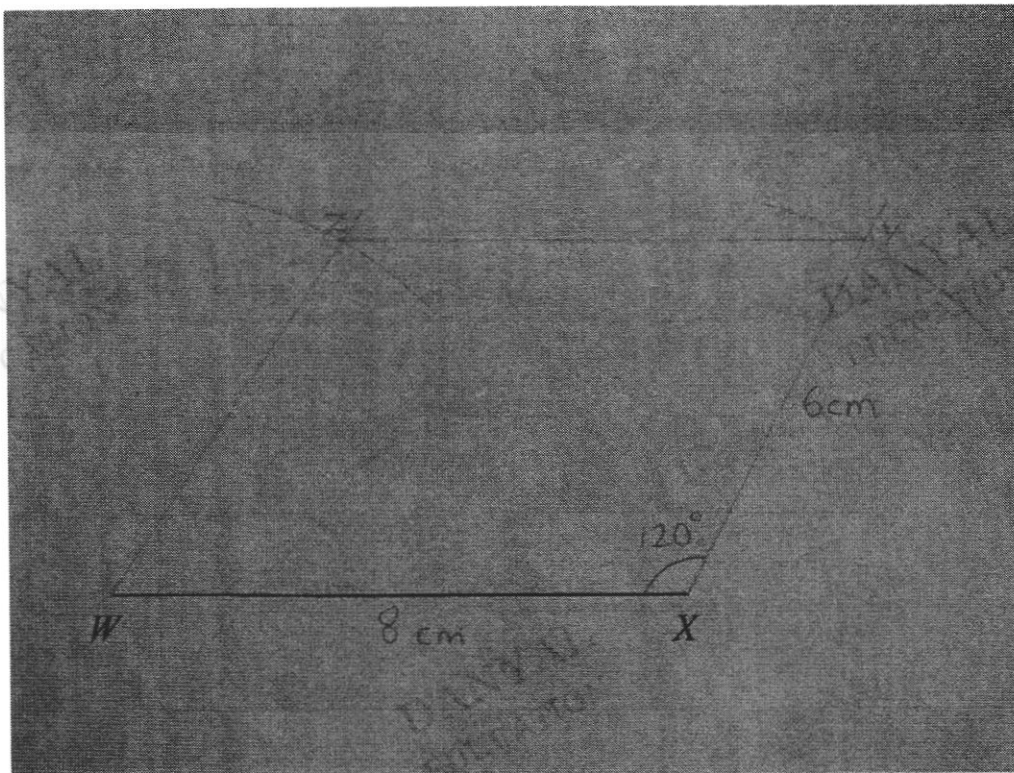**(a)** BC,
(b) $\angle ACB$.
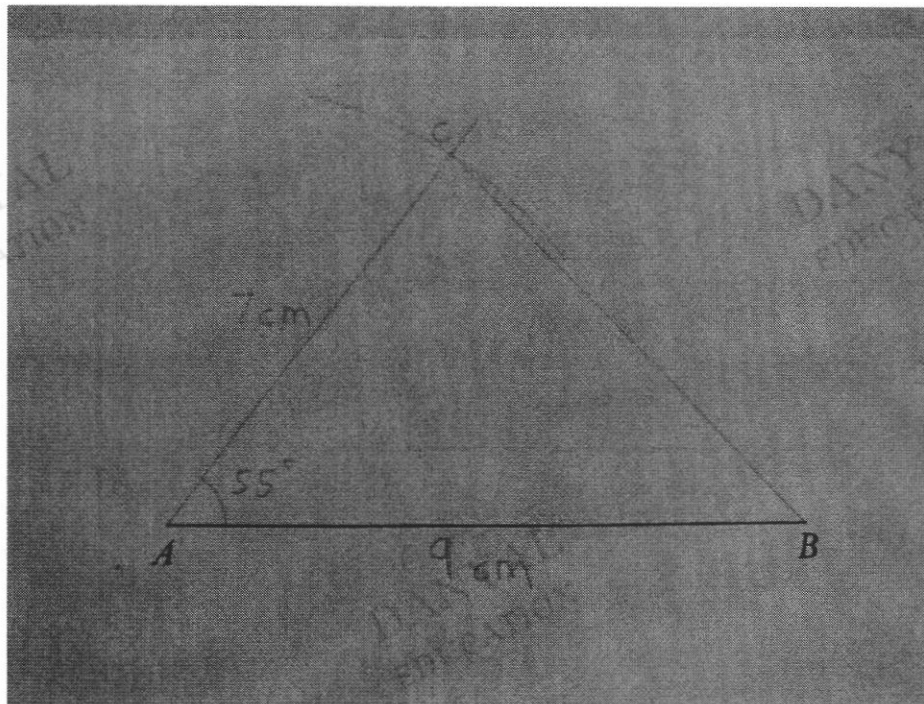
Award 1 mark – accuracy

Award 1 mark – curve

Award 1 mark – labels

Ans: $BC = 7.6 \pm 0.1$cm [1]

Ans: $\angle ACB = 76 \pm 0.1°$ [1]

8 Construct a parallelogram *WXYZ* in which *WX*=8 cm, *XY*= 6 cm and ∠ *WXY* = 120°. The line *WX* has been drawn for you. [3]
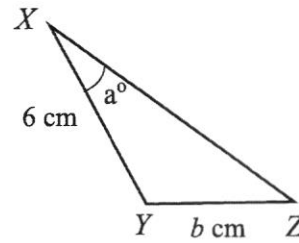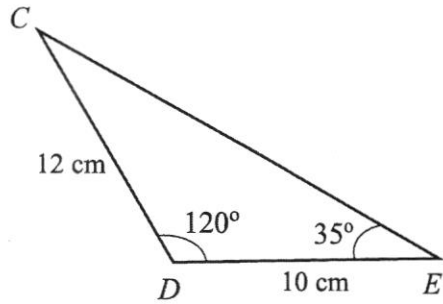
Measure the length of *WY*.

Award 1 mark – accuracy

Award 1 mark – curve

Award 1 mark – labels

Ans: *WY* = 11.5 cm ±0.1 cm [1]

9   Given that triangle *CDE* is similar to triangle *XYZ*.

Find the value of

(a) *a*,

$$x = 180^o - 120^o - 35^o \text{ [M1]}$$
$$= 25^o \text{ [A1]}$$

Ans: 25 [2]

(b) *b*.

$$6 \div 12 = \frac{1}{2} \qquad \text{[M1]}$$

$$\frac{1}{2} \times 10$$

$$= 5 \qquad \text{[A1]}$$
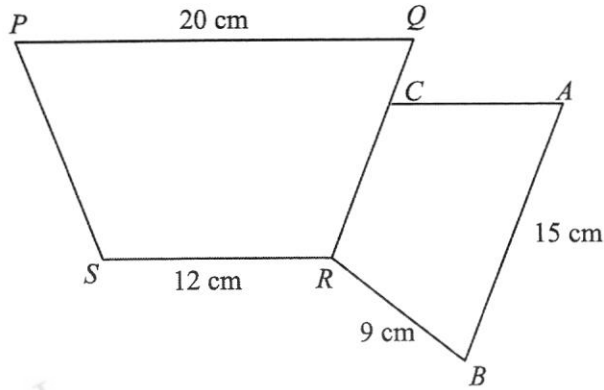
OR

$$Ratio = \frac{12}{6} \qquad \text{[M1]}$$

$$= 2$$

$$b = 10 \div 2$$

$$= 5 \text{ [A1]}$$

Ans: 5 cm [2]

10 Given that quadrilateral *PQRS* is similar to quadrilateral *ABRC*.

Find

(a) the length of *RC*,

$$15 \div 20 = \frac{3}{4} \quad \text{[M1]}$$

$$\frac{3}{4} \times 12$$

$$= 9 \text{ cm} \quad \text{[A1]}$$

Ans 9 cm [2]

(b) the length of *RQ*,

$$20 \div 15 = \frac{4}{3}$$

$$RQ = \frac{4}{3} \times 9 \quad \text{[M1]}$$

$$= 12 \text{ cm} \quad \text{[A1]}$$

Ans 12 cm [2]

(c) the length of *CQ*.

$$CQ = 12 - 9$$
$$= 3 \text{ cm} \quad \text{[B1]} \qquad \text{Award for ECF}$$

Ans 3 cm [B1]

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End of Paper