MS KEY

GCSE Mathematics

Practice Tests: Set 8

Paper 1F (Non-calculator)
Time: 1 hour 30 minutes

You should have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used.**
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1   Write $\frac{7}{100}$ as a decimal.

Converting FDP

"7 hundredths"   U. t h
                 0.0 7

.... = 0.07 ....

(Total for Question 1 is 1 mark)

2   Write $\frac{48}{60}$ as a fraction in its simplest form.

Equivalent Fractions

$$\frac{48}{60} \xrightarrow[\div 2]{\div 2} \frac{24}{30} \xrightarrow[\div 2]{\div 2} \frac{12}{15} \xrightarrow[\div 3]{\div 3} \frac{4}{5}$$

.... $\frac{4}{5}$ ....

(Total for Question 2 is 1 mark)

3   There are 840 tickets available for a concert.

$\frac{1}{7}$ of these tickets have **not** been sold.

How many of the tickets have been sold?

Fractions of an Amount

$$\begin{array}{r} 120 \\ 7 \overline{)840} \end{array}$$

Not Sold $\frac{1}{7}$ of 840 = $\frac{1}{7} \times 840$ = 120

Sold   840 - 120 = 720

.... 720 ....

(Total for Question 3 is 2 marks)

Simplifying Algebraic Fractions

4   Simplify $6x + 8x - 3x$

$6 \text{ lots} + 8 \text{ lots} - 3 \text{ lots} = 11 \text{ lots} \quad = 11x$

............................$11x$............................

(Total for Question 4 is 1 mark)

5   Simplify $4e \times 5f$

$= 4 \times e \times 5 \times f$

$= 20 \times e \times f$

$= 20ef$

............................$20ef$............................

(Total for Question 5 is 1 mark)

6   Solve $8p = 24$ *Solving Equations*

$8p = 24$

$(\div 8) \quad p = 3$

$p =$ ....3............................

(Total for Question 1 is 1 mark)

Single Event Probability

7 Daniel has five bags of coloured sweets.
He picks at random a sweet from each bag.
The table shows the probability that the sweet he picks from each bag is red.

Bag	A	B	C	D	E
Probability of red	0.7	0.9	0.5	1	0.2

(a) From which bag is Daniel least likely to pick a red sweet?

Smallest Probability

.... E ....
                                                                                    (1)

(b) Which bag contains only red sweets?

Certain = 1

.... D ....
                                                                                    (1)

(c) From which bag is Daniel equally likely to pick a red sweet as a sweet of another colour?

Even Chance = $\frac{1}{2}$ = 0.5

.... C ....
                                                                                    (1)

(Total for Question 7 is 3 marks)

8 (a) Change 650 centimetres into metres.

Metric Conversions

100 cm = 1m $650 \div 100 = 6.5$
Convert by ($\div 100$)

.... 6.5 .... metres
                                                                                    (1)

(b) Change 8 litres into millilitres.

1000 mL = 1L $8 \times 1000 = 8000$
Convert by ($\times 1000$)

.... 8000 .... millilitres
                                                                                    (1)

(Total for Question 8 is 2 marks)

9 The two-way table shows some information about where 50 people went for their last holiday.

	UK	Africa	USA	Total
Male	② = 14	① = 7	2	23
Female	16	9	⑤ = 2	⑥ = 27
Total	③ = 30	16	④ = 4	50

(*a*) Complete the table

① 16 − 9 = 7

② 23 − 2 − 7 = 14

③ 14 + 16 = 30

④ 50 − 30 − 16 = 4

⑤ 4 − 2 = 2

⑥ 50 − 23 = 27

(3)

(*b*) What percentage of these 50 people were female **and** went on holiday in Africa?

"9 people out of 50" $= \dfrac{9}{50}$

Convert to % (×2) $= \dfrac{18}{100} = 18\%$

.... %

(2)

(Total for Question 9 is 5 marks)

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10 (*a*) Solve $k - 4 = 13$

Solving Equations

(+4) | $K = 17$

$k =$ .... 17 ....

(1)

(*b*) Simplify $10t + 4d - 3t + 2d$

Simplifying Algebraic Expressions

$7t + 6d$

$k =$ .... $7t + 6d$ ....

(2)

(Total for Question 10 is 3 marks)

11 The bar chart gives information about the total number of medals won by each of six countries at the 2016 Olympic Games.
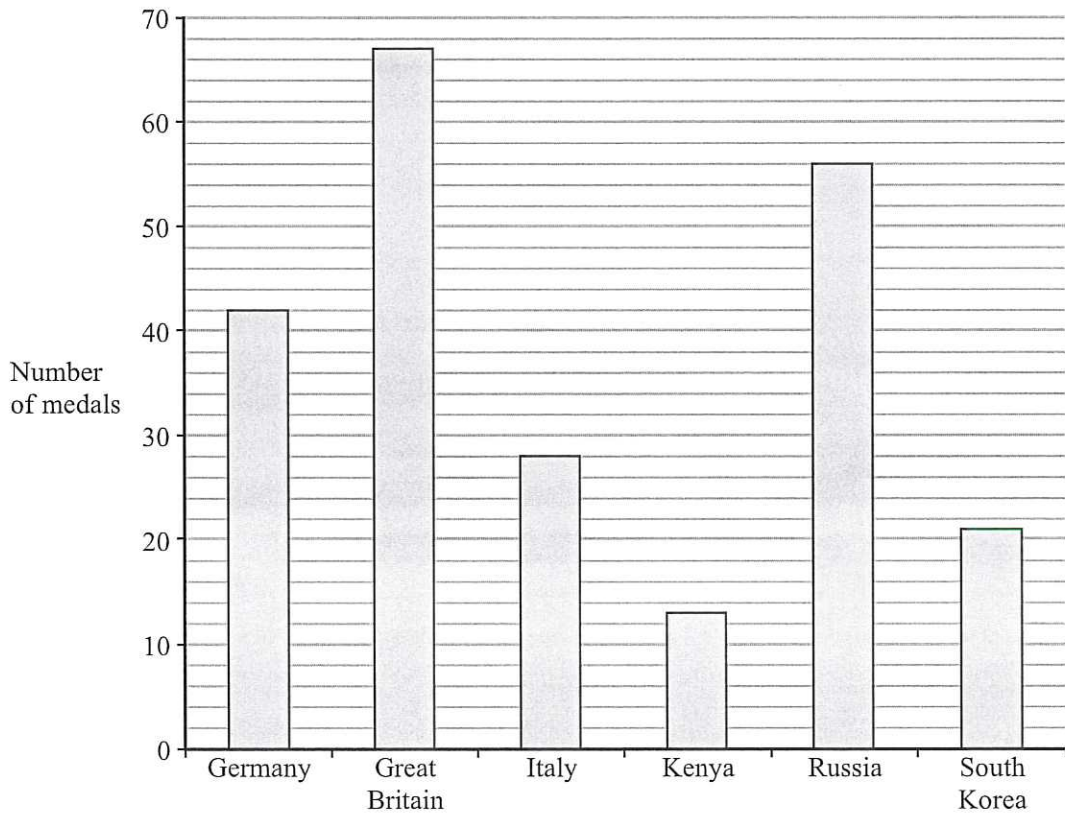
(*a*) Which of these countries won the fewest total number of medals?

....................Kenya....................

(1)

Great Britain won 27 gold medals.

(*b*) How many of the medals won by Great Britain were **not** gold medals?

USE GRAPH | Total medals = 67 medals

NOT GOLD. | 67 − 27   = 40

.... 40 ....

(2)

(c) Write down the ratio of the total number of medals won by Russia to the total number of medals won by Germany.
Give your ratio in its simplest form.

$$2)\overline{56}^{\,28} \quad 2)\overline{42}^{\,21}$$

R : G
56 : 42
(÷2) 28 : 21
(÷7) 4 : 3

............4 : 3............

(2)

The USA won
  46 gold medals
  37 silver medals
  38 bronze medals

Proportion

(d) What fraction of the total number of medals won by the USA were gold medals?

$$P(Gold) = \frac{Gold}{Total} = \frac{46}{46+37+38}$$

$$= \frac{46}{121}$$

$$\begin{array}{r} 46 \\ 37 \\ 38 \\ \hline 121 \end{array} \; \oplus$$

....

(2)

(Total for Question 11 is 7 marks)

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12 Memona has a 5 kg sack of rice and some empty bags.
She fills each bag with 475 grams of rice from the sack.

Worded Division

How many bags can Memona completely fill with rice?

1 kg = 1000 g ∴ 5 kg = 5000 g
(×1000 to convert)
Number of bags: 5000 g ÷ 475 g = $475)\overline{5000.0}$

A maximum of 10 full bags

............10.............

(Total for Question 10 is 3 marks)

13 The diagram shows points *A*, *B* and *C* on a square grid.
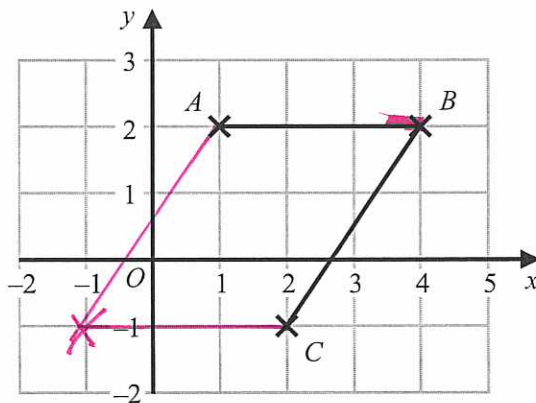
(*a*) Write down the coordinates of *C*.

(x, y)

(........2......... , ...−1.........)

(1)

(*b*) Measure the length of *BC*.
Give your answer in centimetres.

..................3·1.................. cm

(1)

(*c*) On the grid, mark with a cross (X) the point *D* so that *ABCD* is a parallelogram. 2D shape properties
Label this point *D*.

↓

2 sets of parallel sides

(1)

(Total for Question 13 is 3 marks)

14 (*a*) Write down a multiple of 8 that is between 20 and 50.

8, 16, 24, 32, 40 . . .

.... *24* ....
(**1**)

There is only one ~~prime number~~ that is an even number.

(*b*) Write down this number.

Must have two factors

.... *2* ....
(**1**)

Shreya says that 57 is a prime number.   *3)57̄ (19*

(*c*) Is Shreya correct?
Give a reason for your answer.

*No since 57 ÷ 3 = 19 ∴ 3 is a factor as well
as 1 and 57 ∴ more than 2 factors ∴ Not prime.*
(**1**)

(**Total for Question 14 is 3 marks**)

15   (i)   Write down the mathematical name of this 3-D shape.
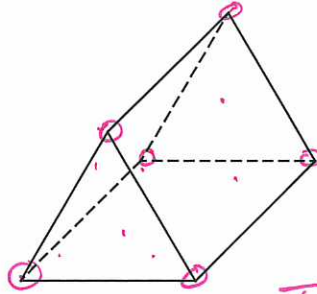
Triangular Prism

(ii) How many faces does the shape have?

5

(iii) How many vertices does the shape have?

6

(**Total for Question 15 is 3 marks**)

16 (*a*) Find the Lowest Common Multiple (LCM) of 12 and 20.

12: 12, 24, 36, 48, 60

20: 20, 40, 60

∴ LCM = 60

....
(2)

(*b*) Find the Highest Common Factor (HCF) of 24 and 56.

$$\begin{array}{c}3\\6\\12\\24\end{array} \quad 24 \quad \begin{array}{c}8\\4\\2\\1\end{array}$$

$$\begin{array}{c}7\\14\\28\\56\end{array} \quad 56 \quad \begin{array}{c}8\\4\\2\\1\end{array}$$

HCF = 8

..............8...............
(2)

(Total for Question 16 is 4 marks)

17

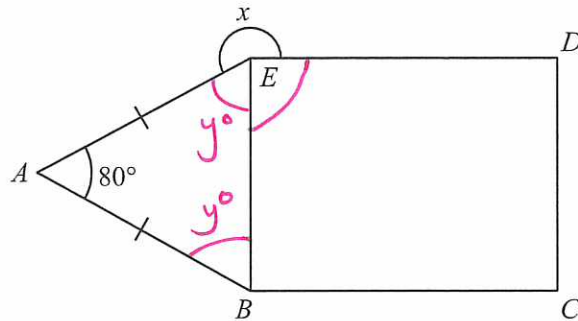Diagram **NOT** accurately drawn

BCDE is a rectangle.
ABE is an isosceles triangle.

AB = AE
Angle *BAE* = 80°

Work out the size of angle *x*.

$A\hat{E}B = A\hat{B}E$

$80° + y + y = 180°$

$80° + 2y = 180°$

$2y = 100°$

$y = 50°$

Also angle E = 90°

$\therefore x = 360° - 90° - 50°$

$x = 220°$

Isosceles triangle

Angles in triangle = 180°

collect

(-80)

(÷2)

Right angle

Angles around a point = 360°

.... 220 °

(Total for Question 17 is 3 marks)

Plotting Straight Lines

x	-2	-1	0	1	2	3
y	-1	1	3	5	7	9

use pattern

$x=0:$ $y=2(0)+3=\underline{3}$

$x=1:$ $y=2(1)+3=\underline{5}$

$x=2:$ $y=2(2)+3=\underline{7}$

$x=3:$ $y=2(3)+3=\underline{9}$

18 On the grid, draw the graph of $y = 2x + 3$ for values of x from -2 to 3.

$y = 2x+3$

(3)

(Total for Question 18 is 3 marks)

19

y=-1
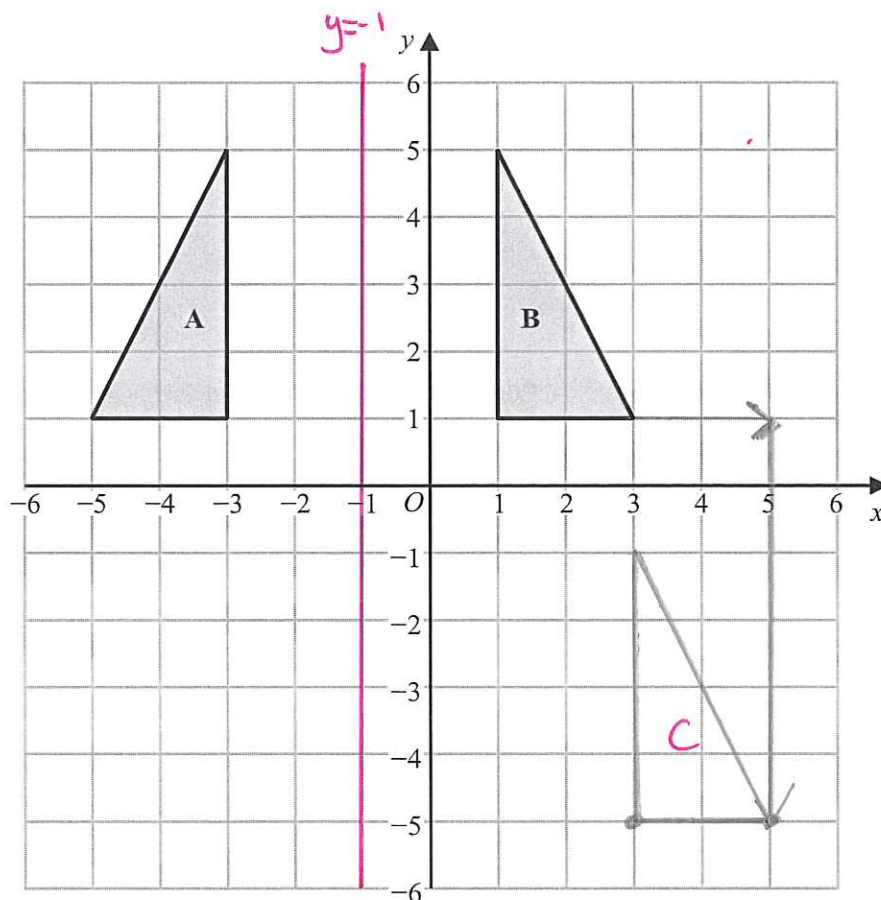
(a) Describe fully the single transformation that maps triangle **A** onto triangle **B**.

Reflection over the line y=-1

(2)

(b) On the grid, translate triangle **B** by the vector $\begin{pmatrix} 2 \\ -6 \end{pmatrix}$ 2 right 6 down

Label your triangle **C**.

(1)

(c) Describe fully the single transformation that maps triangle **C** onto triangle **B**. opposite!

Translation by $\begin{pmatrix} -2 \\ 6 \end{pmatrix}$

(1)

(Total for Question 19 is 4 marks)

Answer all TWENTY questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1   (a) Write 8×10^4 as an ordinary number.

80000

....

(1)

(b) Work out $(3.5 \times 10^5) \div (7 \times 10^8)$
Give your answer in standard form.

Split

$3.5 \div 7 = 0.5$

$10^5 \div 10^8 = 10^{-3}$

Combine $= 0.5 \times 10^{-3}$

Standard form $= 5 \times 10^{-1} \times 10^{-3}$

$= 5 \times 10^{-4}$

5×10^{-4}

....

(2)

(Total for Question 1 is 3 marks)

2 (*a*) Simplify $y^5 \times y^9$

$$a^m \times a^n = a^{m+n}$$

.... y^{14} ....

(1)

(*b*) Simplify $(2m^3)^4$

$$= 2m^3 \times 2m^3 \times 2m^3 \times 2m^3$$

$$= 16m^{12}$$

.... $16m^{12}$ ....

(2)

(*c*) Solve $5(x + 3) = 3x - 4$
Show clear algebraic working.

Solving Equations

$$5(x+3) = 3x - 4$$

Expand $\quad 5x + 15 = 3x - 4$

$(-3x) \quad 2x + 15 = \quad -4$

$(-15) \quad 2x \quad = \quad -19$

$(\div 2) \quad x \quad = \quad -19/2$

$x =$ .... $-19/2$ ....

(3)

(Total for Question 2 is 6 marks)

3   Here is a Venn diagram.
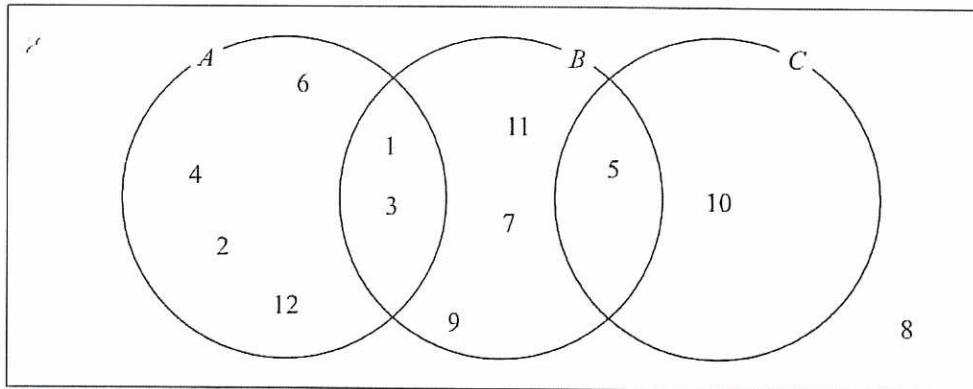
Write down the numbers that are in the set

(i) A

.....1, 2, 3, 4, 6, 12.....

(ii) $B \cup C$

    or
    =

.....1, 3, 5, 7, 9, 10, 11.....

(2)

(Total for Question 3 is 2 marks)

4   (*a*)   Make *a* the subject of the formula $M = ac - bd$

$$M = ac - bd$$
$(+bd)$ $M + bd = ac$
$(\div c)$ $\dfrac{M + bd}{c} = a$

$$\dfrac{M + bd}{c} = a$$

....
                      (2)

(*b*)   Solve the inequality $5x - 4 < 39$ Solving Inequalities

$$5x - 4 < 39$$
$(+4)$ $5x < 43$
$(\div 5)$ $x < \dfrac{43}{5}$

$$x < \dfrac{43}{5}$$

....
                      (2)

(*c*)   Factorise fully $18e^2 f^3 - 12e^3 f$ Factorising

6 is a factor

e^2 is a factor

f is a factor

$$\therefore = 6e^2 f (3f^2 - 2e)$$

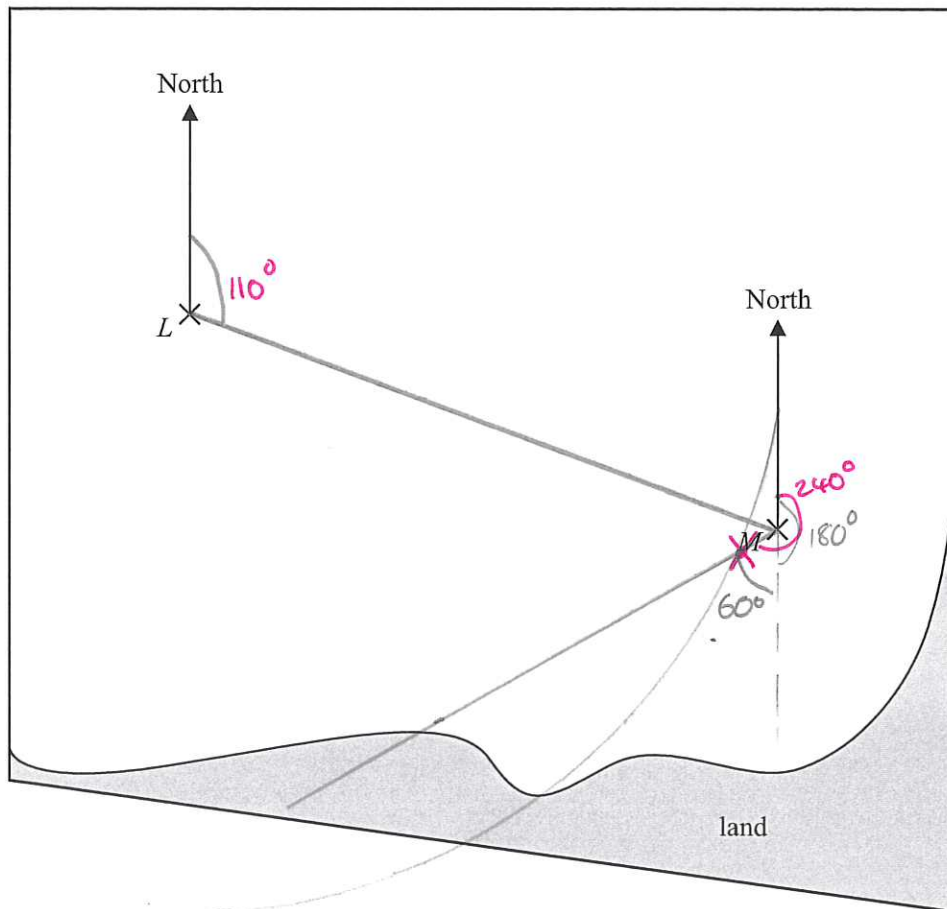$$6e^2 f (3f^2 - 2e)$$

....
                      (2)

(Total for Question 4 is 6 marks)

25 The accurate scale drawing shows the positions of two ships, *L* and *M*.

(*a*) Find the bearing of ship *M* from ship *L*.

.... **110** .... °

(1)

The scale of the drawing is 1 cm to 5 km.

Ship *P* is 40 km from *L* and on a bearing of 240° from *M*.

(*b*) On the diagram, mark with a cross (×) the position of ship *P*.

① Draw line on bearing 240° from M

② 1cm : 5km
×8 ↓   8cm : 40km ↓×8

∴ Draw arc 8cm radius from L.

③ Point of intersection.

(3)

(Total for Question 25 is 4 marks)

26 You can use this graph to change between temperatures in degrees Celsius (°C) and temperatures in degrees Fahrenheit (°F).
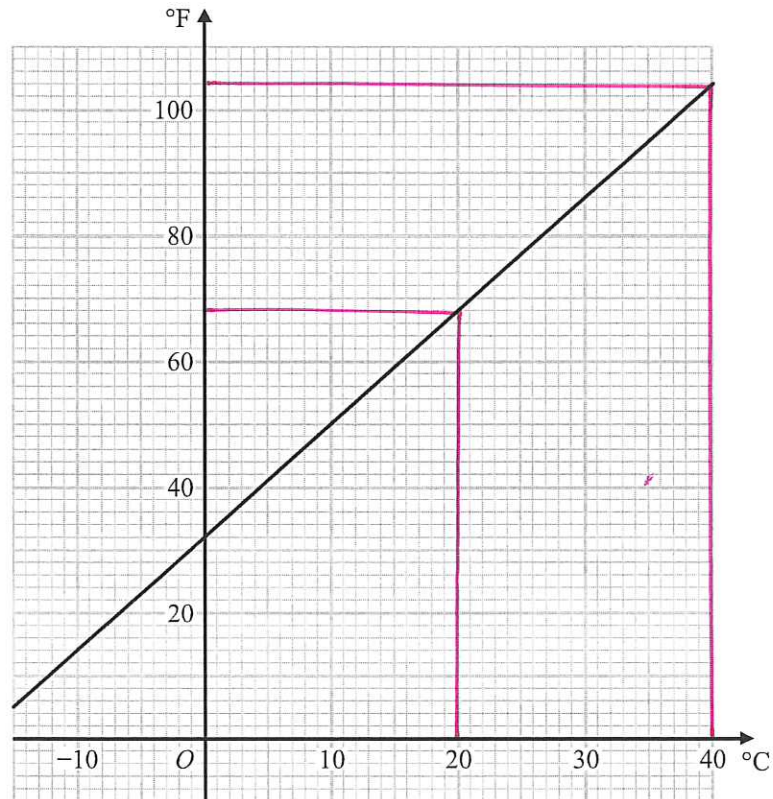
The temperature in Dubai on Monday increased by 20 °C from midnight to midday.

(*a*) What is this temperature increase in degrees Fahrenheit?

USE THE GRAPH

.... **68** .... °F

(2)

Maninder says,

"30 °C is the same as 86 °F, therefore 60 °C will be the same as 172 °F."

(*b*) Is Maninder correct?
Give a reason for your answer.

No because the ratio is not 1:2
e.g: 20°C = 68°F BUT 40°C = 104F, not just double!

(1)

(Total for Question 26 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS