# GCSE Mathematics Practice Tests: Set 3

MR. LEWIS

## Paper 2F (Calculator) Solutions.

### Time: 1 hour 30 minutes

You should have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator.

## 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 may 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.    5 pencils cost £1.85

Work out the cost of 9 of these pencils

÷5  5 pencils = £1.85 ÷5

1 pencil = £0.37

×9                    ×9

9 pencils = £3.33

£....3.33....

**(Total 2 mark)**

**2.** These two triangles are congruent.

Diagram **NOT** accurately drawn

$x$ 8 cm

37°

8 cm
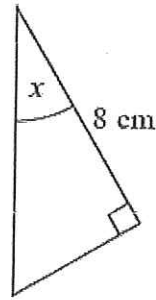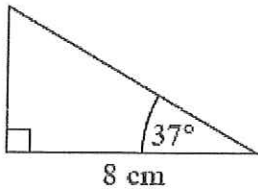
(a) Write down the size of the angle marked $x$.

.................... 37 ....................°

(1)

These two quadrilaterals are congruent.

Diagram **NOT** accurately drawn

60° 140° $y$ 70°

70° $a$ 140° $d$ $b$ 60° $c$
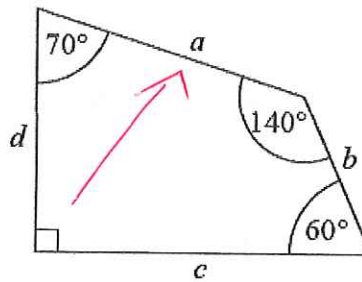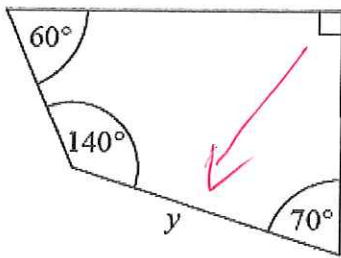
Side $y$ is equal to one of the sides, $a$ or $b$ or $c$ or $d$.

(b) Which side?

.................... a ....................

(1)

**(Total 2 mark)**

**3.**
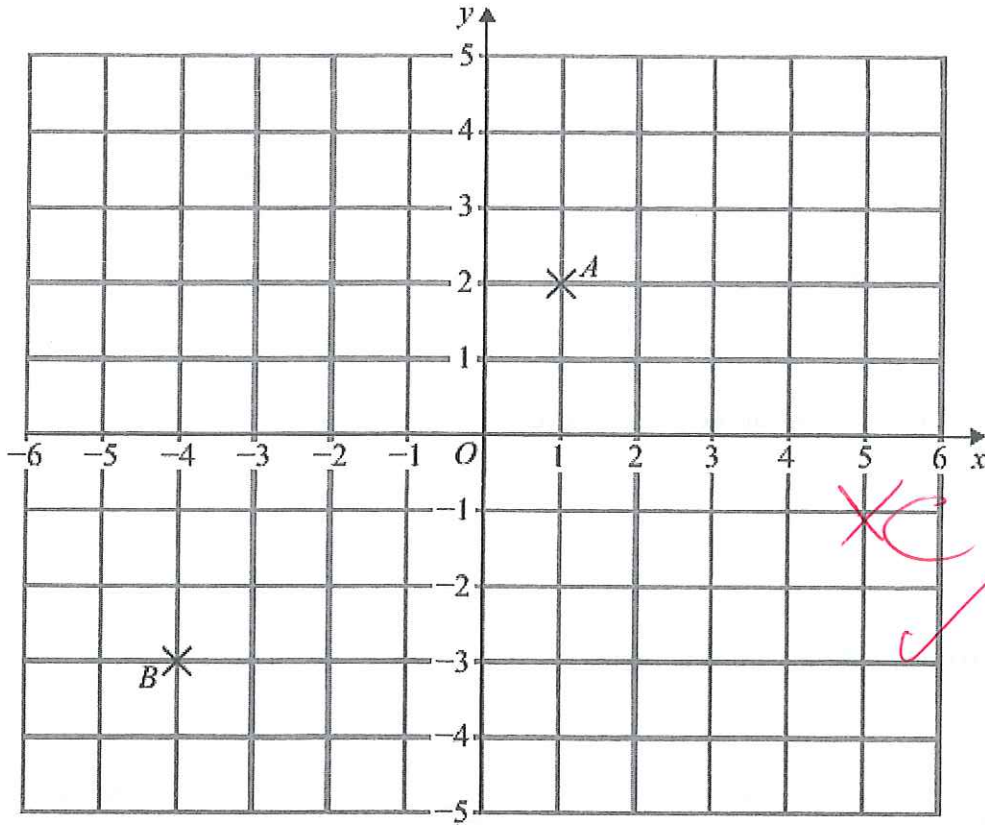


(a) (i) Write down the coordinates of the point *A*.

( ...1... , ...2... )

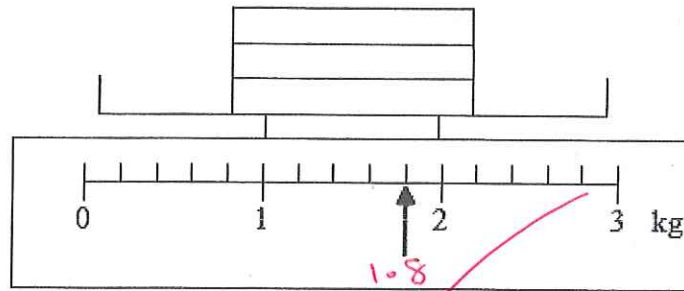(ii) Write down the coordinates of the point *B*.

( ...−4... , ...−3... )

(2)

(b) On the grid, plot the point (5, −1).
Label this point *C*.

(1)

**(Total 3 mark)**

4. The scale shows the total weight of 3 boxes.

1.8 ✓

Each box is the same weight.

Work out the weight of one box.

1.8 kg ✓
÷ 3 ✓

0.6 ✓ .................................. kg

**(Total 3 mark)**

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5. The table shows midday temperatures in four cities on one day in winter.

| City | Midday temperature (°C) |
|---|---|
| Paris | 2 |
| Cardiff | −5 |
| London | −3 |
| Edinburgh | −1 |

(a) Which city had the lowest midday temperature?

CARDIFF ✓
..........................
✓ **(1)**

By midnight, the temperature in London had fallen by 5°C.

(b) Work out the midnight temperature in London.

−3 − 5 = ✓

−8 ✓ .......................... °C

✓ **(2)**

**(Total 3 marks)**

**6.** Here is a café menu.

| Menu | |
|---|---|
| Cup of tea | 75p |
| Cup of coffee | 95p |
| Can of cola | 80p |
| Beefburger | £1.65 |
| Hot dog | £1.40 |

Kerry buys **one** beefburger and **one** can of cola.

(a) Work out the total cost.

£1.65 + £0.80

£ 2.45

(2)

Tyler wants to buy 2 hot dogs, a cup of tea and a can of cola. He has a £5 note.

(b) Does Tyler have enough money?
Give reasons for your answer.

£1.40 × 2 = £2.80
+ £0.75
+ £0.80
_____
£4.35     less than £5.

So he has enough money

and 65p change

(3)

**(Total 5 marks)**

7.    (a)  Work out the number which is exactly halfway between 1.2 and 1.4

1.3

(1)

(b)  Change 0.4 kilograms to grams.

×1000

400 grams

(1)

(c)  Change 90 km/h into metres/second.

×1000   90 km per hour.

90,000 m per hour

÷60   1500 m per minute

÷60   25 m per second

25 metres/second

(2)

**(Total 4 marks)**

**8.** Here is a list of numbers.

$\cancel{4}$    $\cancel{8}$    $\cancel{5}$    $\cancel{9}$    $\cancel{10}$    $\cancel{5}$    $\cancel{6}$    $\cancel{3}$    $\cancel{4}$

(a) Work out the median.

3   4   4   5   5   6   8   9   10

................................ 5 ....................

(2)

(b) Work out the mean.

$$\frac{4+8+5+9+10+5+6+3+4}{9}$$

$$= \frac{54}{9}$$

................................ 6 ....................

(2)

**(Total 4 mark)**

**9.** There are 120 cars in a car park.

| Colour of car | Frequency | | |
|---|---|---|---|
| Red | 40 | ×3 | = 120° |
| Silver | 24 | ×3 | = 72° |
| Blue | 19 | ×3 | = 57° |
| Other | 37 | ×3 | = 111° |

120  ×3    360°

Draw an accurate pie chart for this information.
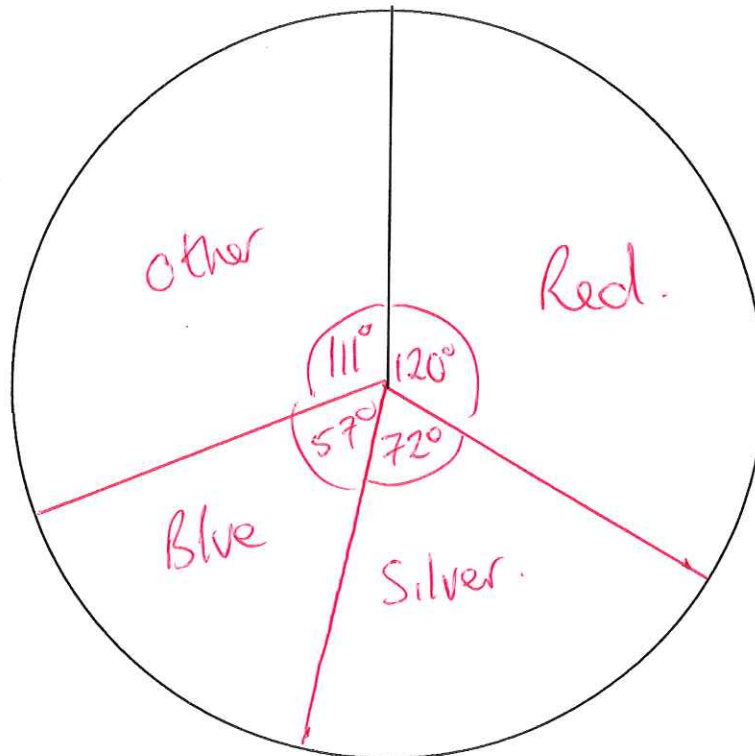


**(Total 3 marks)**

10. The cost of 1.5 kg of peaches is £0.84

The total cost of 3 kg of peaches and 2 kg of apples is £2.34

Work out the cost of 1 kg of apples.

$\times 2 \begin{cases} 1.5 \text{ kg peaches} = £0.84 \\ 3 \text{ kg } \text{''} = £0.84 \times 2 = £1.68 \checkmark \end{cases}$

3kg peaches + 2kg apples = £2.34

£1.68 + 2kg apples = £2.34

2kg apples = £0.66 $\checkmark$

÷2                    ÷2

1kg apples = £0.33

£0.33

**(Total 3 marks)**

**11.** Here is a rule for working out the volume of a pyramid.

> Multiply the base area by the height and
>
> then divide by 3

A pyramid has a base area of 9 cm² and a height of 4 cm.

(a) Use the rule to work out the volume of this pyramid.

$$\frac{9 \times 4}{3} = \frac{36}{3}$$

.................................... 12 cm³

(2)

A different pyramid has a volume of 20 cm³.
The base area of this pyramid is 10 cm².

(b) Work out the height of this pyramid.

$$\frac{10 \times x}{3} = 20$$

$$10 \times x = 60$$

$$x = 6$$

.................................... 6 cm

(3)

**(Total 5 marks)**

12. Brian wants to go on holiday.
He is going to take out a loan of £500 to help pay for the holiday.

Brian will have to pay back the £500 plus 20% interest over 12 months. He will pay back the same amount of money each month.

How much money will he pay back each month?

£500    10% = £50    20% = £100 ✓

500 + 100 = 600 ✓

$\frac{600}{12}$ = 50 ✓

£........50........

(Total 4 marks)

13. (a) Work out $\frac{5}{9}$ of 72 kg.

$\frac{5}{9} \times \frac{72^{8}}{1}$ ✓

........40........kg

(2)

(b) Show that $\frac{1}{3} + \frac{4}{15} = \frac{3}{5}$

$\times 5 \left( \frac{1}{3} + \frac{4}{15} \right)$ ✓

$\frac{5}{15} + \frac{4}{15}$

$\frac{9}{15} \xrightarrow{\div 3} \frac{3}{5}$ ✓

$\div 3$

(2)

(Total 4 marks)

**14.** The diagram shows part of the design of a stained glass window.
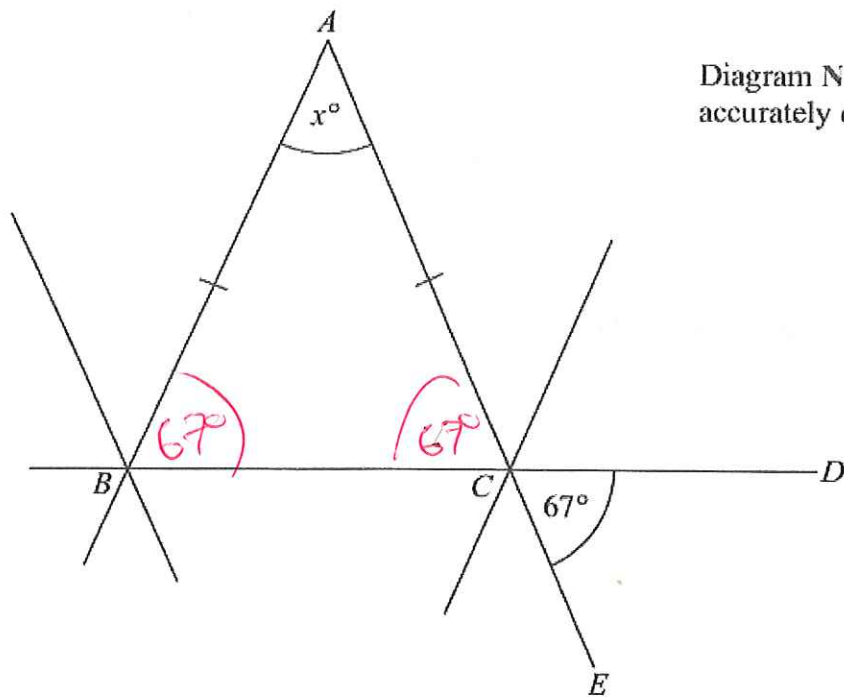


Diagram NOT accurately drawn

*ABC* is an isosceles triangle. *BCD* and *ACE* are straight lines. Angle *DCE* = 67°.

Work out the size of the angle marked *x*°. Give reasons for your answer.

Angle ACB = 67° (vertically opposite angles are equal)

Angle ABC = 67° (Base angles in an isosceles triangle are equal).

$x + 67 + 67 = 180°$ (angles in a triangle add up to 180°)

$x + 134 = 180$

$x = 46°$

**(Total 4 marks)**

**15.**

$S \dfrac{O}{H}$

$\boxed{C \dfrac{A}{H}}$

$T \dfrac{O}{A}$

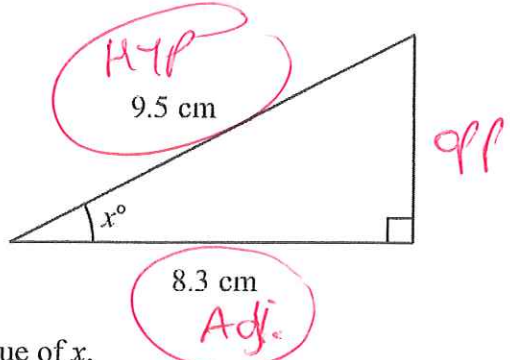$\boxed{HYP}$  9.5 cm

$x°$

$8.3$ cm  $\boxed{Adj.}$

99

Diagram **NOT** accurately drawn

Work out the value of $x$.
Give your answer correct to 1 decimal place.

$\cos x = \dfrac{\text{Adjacent}}{\text{Hypotenuse}} = \dfrac{8.3}{9.5}$

$x = \cos^{-1}\left(\dfrac{8.3}{9.5}\right)$
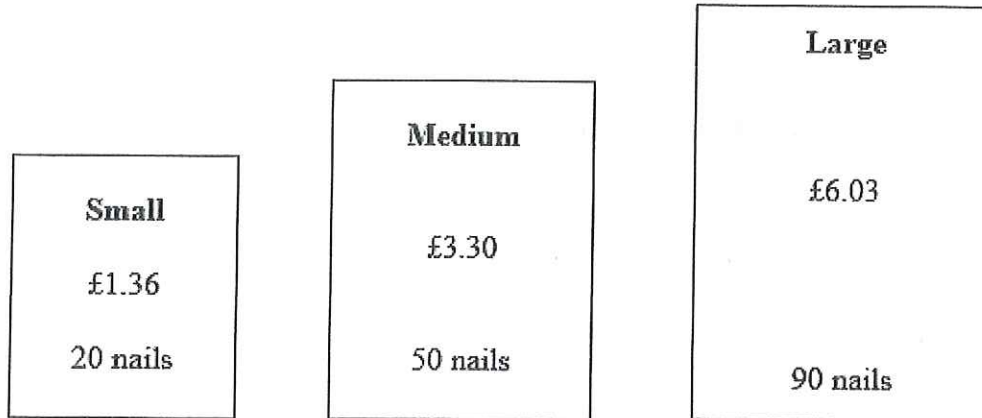
$x = 29.1103$

$x = \underline{\ \ 29.1\ \ }$

**(Total 3 marks)**

**16.** Nails of length 35 millimetres are sold in three sizes of packets.

There are 20 nails in a small packet, costing £1.36
There are 50 nails in a medium packet, costing £3.30
There are 90 nails in a large packet, costing £6.03

|  |  | Large |
|---|---|---|
|  | Medium | £6.03 |
| Small | £3.30 |  |
| £1.36 |  |  |
| 20 nails | 50 nails | 90 nails |

(a) Which size of packet is the best value for money?
You must show clearly how you got your answer.

SMALL.

20 nails = £1.36

1 nail = £0.068

MEDIUM.

50 nails = £3.30

1 nail = £0.066

↑
Cheapest.

LARGE:

90 nails = £6.03

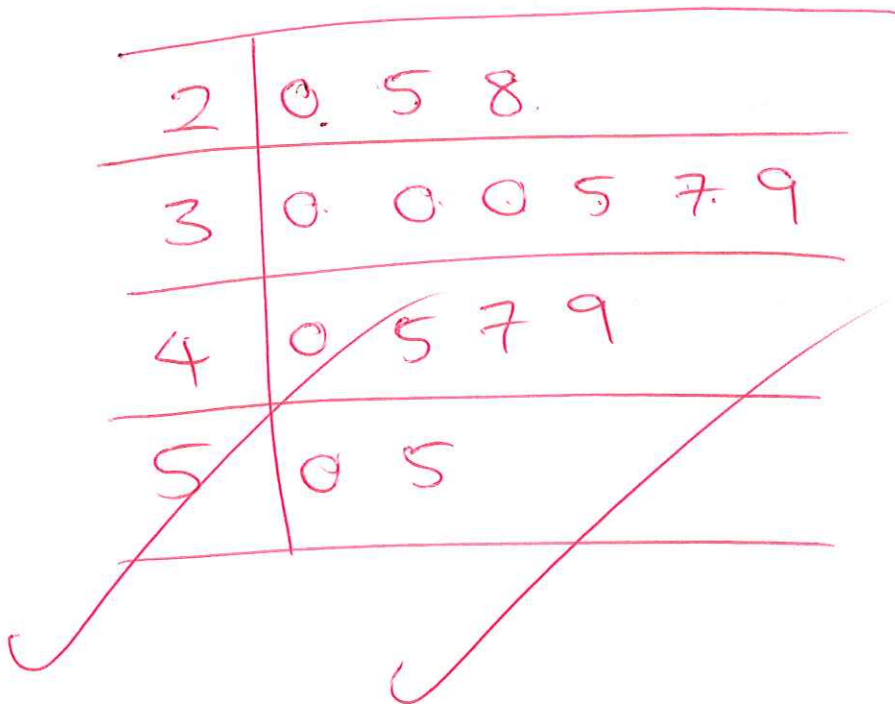1 nail = £0.067

Medium is best value for money

**(4)**

Nails of different lengths are sold in mixed packets.

Here are the lengths, in millimetres, of the nails in a mixed packet.

| 20 | 35 | 49 | 30 | 45 |
| 40 | 50 | 25 | 39 | 30 |
| 30 | 37 | 47 | 55 | 28 |

(b)  Draw an ordered stem and leaf diagram for this information.

| 2 | 0 5 8 |
|---|-------|
| 3 | 0 0 0 5 7 9 |
| 4 | 0 5 7 9 |
| 5 | 0 5 |

Key

3 | 5 = 35 mm

(3)

(c)  Find the median length.

(no middle one!)

..................................... mm

37

(1)

**(Total 8 marks)**

**17.** (a) Expand and simplify $(x + 9)(x - 3)$

$$x^2 - 3x + 9x - 27$$

$$x^2 + 6x - 27$$

(2)

(b) Make $a$ the subject of the formula $v = u + at$

$$v - u = at$$

$$\frac{v - u}{t} = a$$

$$a = \frac{v - u}{t}$$

(2)

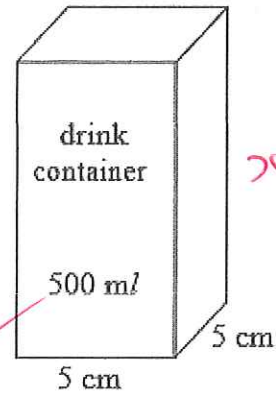**(Total 4 marks)**

18. Suha Industries make drink containers.

They need to design a new container for 500 ml of drink.

The container has to be in the shape of a cuboid.
The base of the cuboid will be a square.
The square has sides of length 5 cm.

Work out the <u>minimum height</u> of the container.

Diagram **NOT**
accurately drawn

drink container

$x$

500 ml

5 cm

5 cm

1 litre = 1000 cm$^3$

½ litre = 500 ml = 500 cm$^3$ ✓

$5 \times 5 \times x = 500$

$25x = 500$

$x = \dfrac{500}{25}$ ✓

$x = 20$

............................ **20** ............................ cm

**(Total 3 marks)**

19. On July 1st 2004, Jack invested £2000 at 5% per annum compound interest.

Work out the value of Jack's investment on July 1st 2006

2 years ✓

$2000 \times 1.05^2$ ✓ ✓

£ ............ **2205** ............

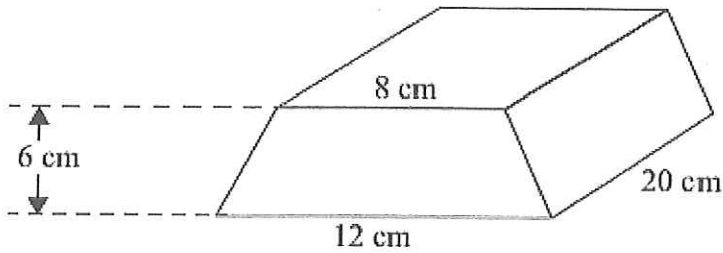**(Total 3 marks)** ✓

**20.**



8 cm

6 cm

20 cm

12 cm

Diagram **NOT**
accurately drawn

The diagram shows a solid prism made from metal.
The cross-section of the prism is a trapezium.

The parallel sides of the trapezium are 8 cm and 12 cm.
The height of the trapezium is 6 cm.
The length of the prism is 20 cm.

The density of the metal is 5 g/cm$^3$.

Calculate the mass of the prism.
Give your answer in kilograms.

Density = $\dfrac{MASS}{VOLUME}$

Density × Volume = MASS.

Volume = AREA of X-section × length

= $\dfrac{8 + 12}{2}$ × 6 × 20

= 10 × 6 × 20 = 1200 cm$^3$

MASS = 5 × 1200

= 6000 grams

÷ 1000

= 6 Kg

6

................................ kg

**(Total 5 marks)**

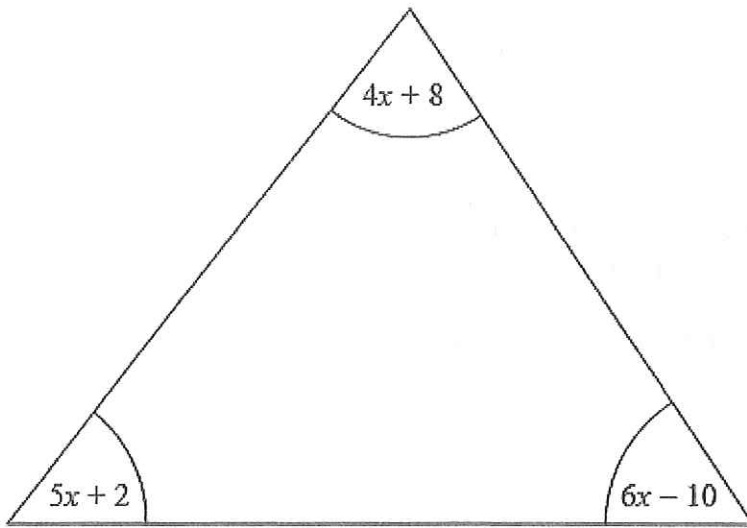**21.** The diagram shows a triangle.



4x + 8

Diagram **NOT**
accurately drawn

5x + 2

6x − 10

All the angles are measured in degrees.

Show that the triangle is isosceles.

$$4x + 8 + 5x + 2 + 6x - 10 = 180°$$

$$15x = 180°$$

$$\boxed{x = 12°}$$

$$5x + 2 = 5 \times 12 + 2 = 62°$$

$$6x - 10 = 6 \times 12 - 10 = 62°$$

$$4x + 8 = 4 \times 12 + 8 = 56°$$

2 angles the same

So Triangle is an isosceles triangle.

**(Total 5 marks)**

_____

**TOTAL FOR PAPER IS 80 MARKS**