



13/2

October/November 20XX

Time: 2 Hours

**Mark answers by shading the oval heavily, like this: - **

CENTRE NUMBER				CANDIDATE NUMBER			
B	W						
		0	0	0	0	0	0
		1	1	1	1	1	1
		2	2	2	2	2	2
		3	3	3	3	3	3
		4	4	4	4	4	4
		5	5	5	5	5	5
		6	6	6	6	6	6
		7	7	7	7	7	7
		8	8	8	8	8	8
		9	9	9	9	9	9

1. Write your full names and examination number in the space provided above.
2. Answer **ALL** questions.
3. **ALL** answers must be written in the spaces provided.
4. Show all the necessary working.
5. Calculators may be used in this paper.
6. Use the value π in your calculator unless otherwise stated.
7. If the degree of accuracy is **not** specified in the question and the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

DO NOT TURN THE PAGE UNTIL YOU ARE TOLD TO DO SO



SECTION A**(30 Marks)**Answer **all** questions in this section.

1. Simplify $2g + 5h - 3g + 4h$.

..... (2)

2. Evaluate $17 \times \sqrt{5} - \frac{2}{2 + \sqrt{3}}$.

..... (1)

3. Re-arrange the formula $T = 3n - 7$ to make n the subject of the formula.

..... (2)

4. Solve the equation $2x + 10 + 3x = 6$.

..... (2)

5. Express $\frac{5}{p-1} - \frac{4}{p+3}$ as a single fraction.

..... (3)

6. Factorise $3x^2 - 27$ completely.

$$\dots\dots\dots (2)$$

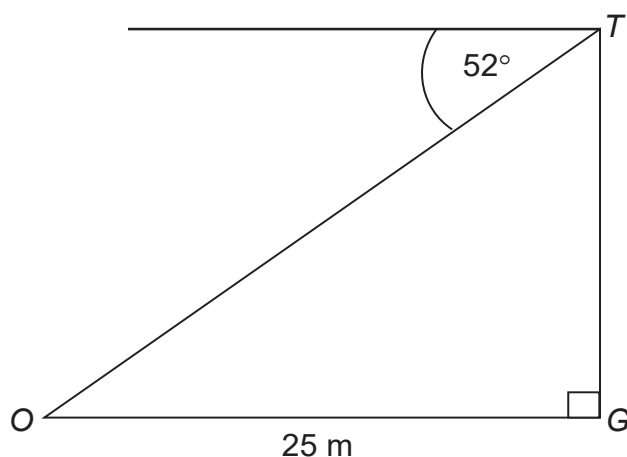
7. Construct triangle EFG such that $EF = 5.2$ cm, $EG = 6$ cm and $FG = 9$ cm. Showing all construction lines.

..... (2)

8. Solve the simultaneous equations $2x - 3y = 7$ and $2x + y = 11$.

$$x = \dots\dots\dots \text{ and } y = \dots\dots\dots (3)$$


9. The diagram below shows points O , G and T . The points O and G are 25 m apart on level ground. G is on the foot of a building and T is at the top of the building, vertically above G . The angle of depression of O from T is 52° .



Calculate GT , the height of the building.

..... m (3)

10. A line segment, RS , has endpoints with coordinates $R(3, -2)$ and $S(x, 12)$. The coordinates of the midpoint of the line RS are $(-4, 5)$.

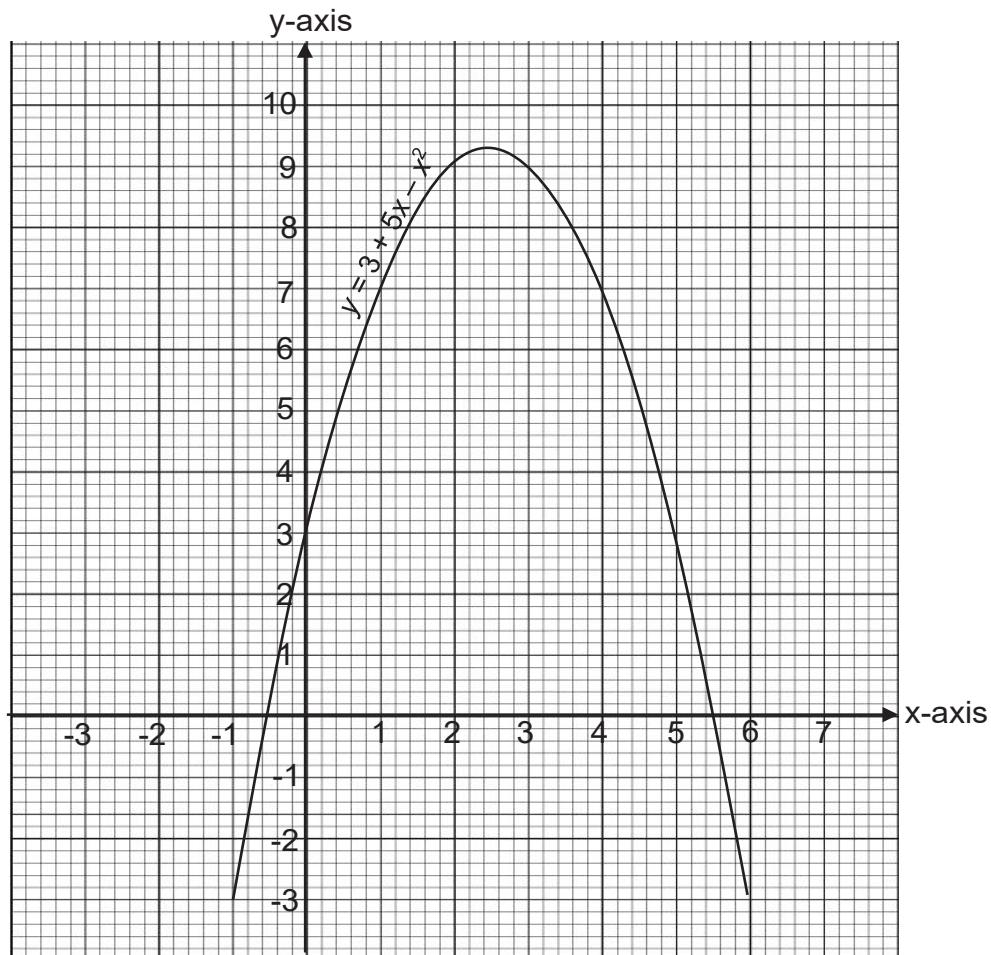
Calculate the value of x .

$x =$ (2)

11. Simplify $(5x - 3)(x - 2)$.

$$\dots\dots\dots (2)$$

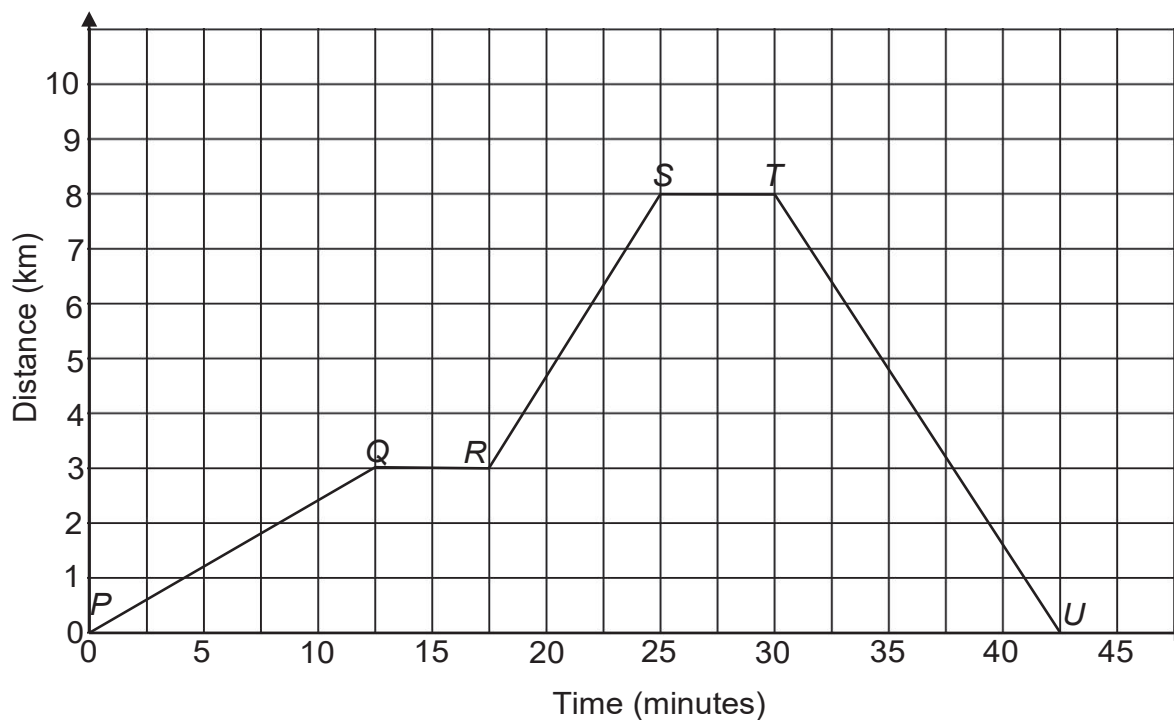
12. The diagram below shows the graph $y = 3 + 5x - x^2$.



- (a) On the same pair of axes above, draw the line $y = 1$. (1)
- (b) Use the graphs to find the values of x satisfying the equations $y = 3 + 5x - x^2$ and $y = 1$.

$$x = \dots\dots\dots \text{ or } x = \dots\dots\dots (2)$$


13. The graph below represents Phenyo's journey during a training session, with points P , Q , R , S , T and U .



- (a) Explain what was happening between point Q and point R .

.....

..... (1)

- (b) State with a reason, the two consecutive points between which Phenyo was **fastest**.

Points

.....

Reason

.....

(2)

(50 Marks)

14. Keletso ordered a vehicle from a dealership in Japan. The cost of the vehicle was P56 000. She paid a deposit of 70% of the cost of the vehicle and thereafter an equal monthly instalment of P4 200 per month for 6 months.

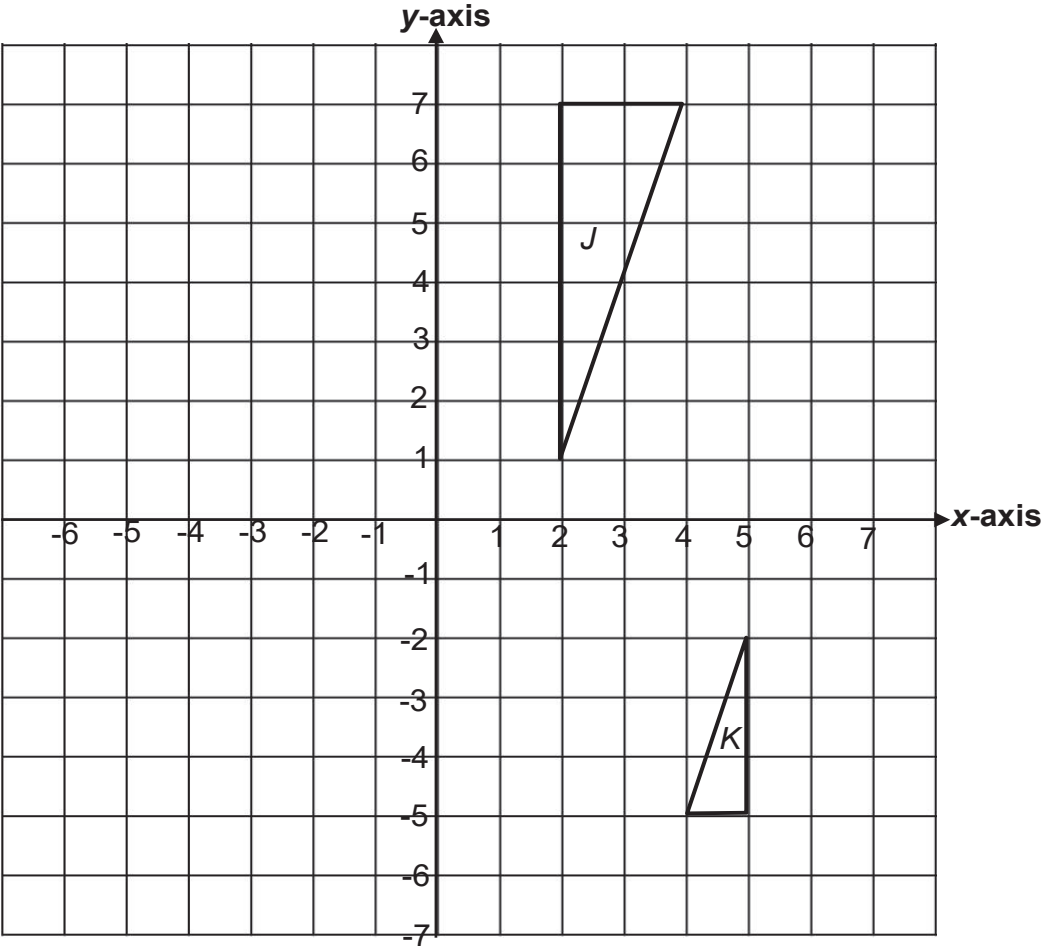
- P** (2)

- P** (2)

- % (2)

- P** (2)

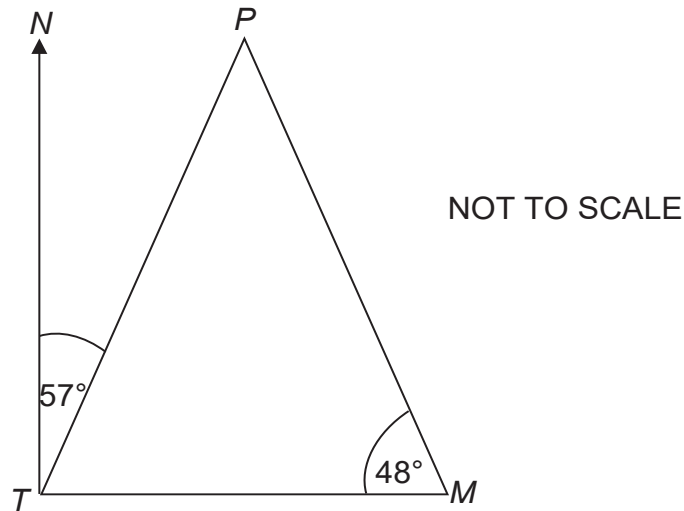
15. In the diagram below, triangle J is mapped onto triangle K after a transformation.



- (a) Describe fully the single transformation that maps triangle J onto triangle K .
.....
..... (3)
- (b) On the same pair of axes, draw the image of triangle J after a reflection in the y -axis. (2)
-

- 16.** The diagram below shows the positions of Molebatsi's house (M), Thero's house (T), and Pako's house (P) on a map. Thero's house and Molebatsi's house have equal distance from Pako's house.

The bearing of P from T is 057° and angle PMT is 48° .



- (a)** What is the size of the angle MPT ?

$$\dots\dots\dots (2)$$

- (b)** What is the bearing of T from P ?

$$\dots\dots\dots (2)$$

- (c) A water standpipe, S , is erected along TM . The distance of TM is 1150 m and S is the midpoint of TM .

Calculate the distance, PS , of the standpipe from Peo's house.

$$\dots\dots\dots (2)$$


17. The first four terms of a sequence are 6, 13, 20 and 27.

(a) What is the 5th term of the sequence?

..... (1)

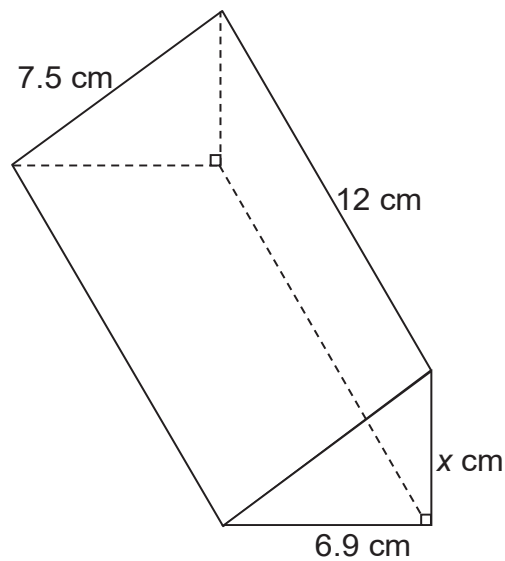
(b) What is the expression for the n^{th} term of the sequence?

..... (2)

(c) Hence or otherwise, calculate the 105th term of the sequence.

..... (2)

18. A manufacturing company produces chocolate bars in the form of a prism as shown in the diagram below.



- (a)** What is the geometrical name of the cross-section of the prism?

..... (1)

- (b)** Show that the height of the chocolate bar, x cm, is 2.94 cm correct to three significant figures.

$$\dots\dots\dots (2)$$

- (c) Calculate the volume of the chocolate bar, correct to **one** decimal place.

Volume = cm³ (3)

- (d) The chocolate bars are to be packaged in a box which is in the form of a cuboid. The internal measurements of the box are 2.95 cm by 7.0 cm by 25 cm.

Calculate the **maximum** number of chocolate bars that can be packaged in the box.

$$\dots\dots\dots (3)$$


19. The table below shows the number of crimes reported against children in a Police station in the month of June.

Type of crime	No of Children
Defilement	8
Murder	3
Neglect	12
Others	7

(a) (i) The information in the table is to be illustrated in a pie chart.

Calculate, to the nearest degree, each of the sector angles of the pie chart.

Defilement

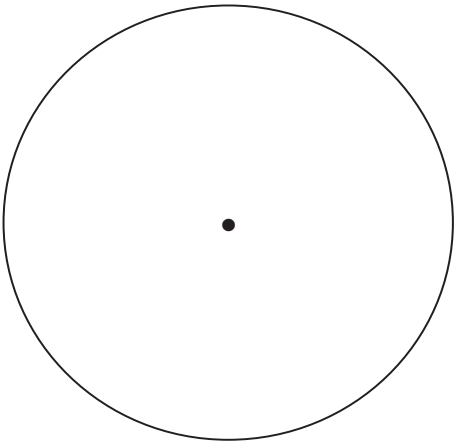
Murder

Neglect

Others

(3)

(ii) In the circle below, draw a pie chart to illustrate the information in the table.



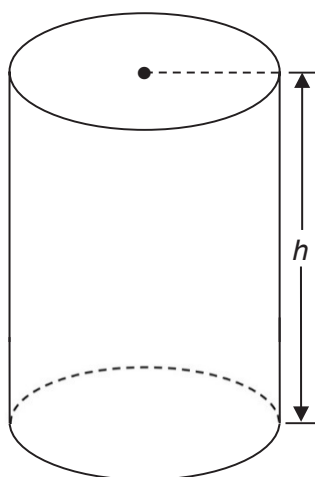
(2)

- (b) In the month of July, the sector angle which represented 13 cases of **physical abuse** had a sector angle of 120° .

Calculate the **total** number of crimes reported to the Police station in July.

..... (3)

- 20.** A storage tank is in the form of a cylinder. The storage tank has a radius of 0.45 metres and a height of h metres. The volume of the storage tank is 0.954 m^3 .



- (a)** Calculate the height, h , of the storage tank.

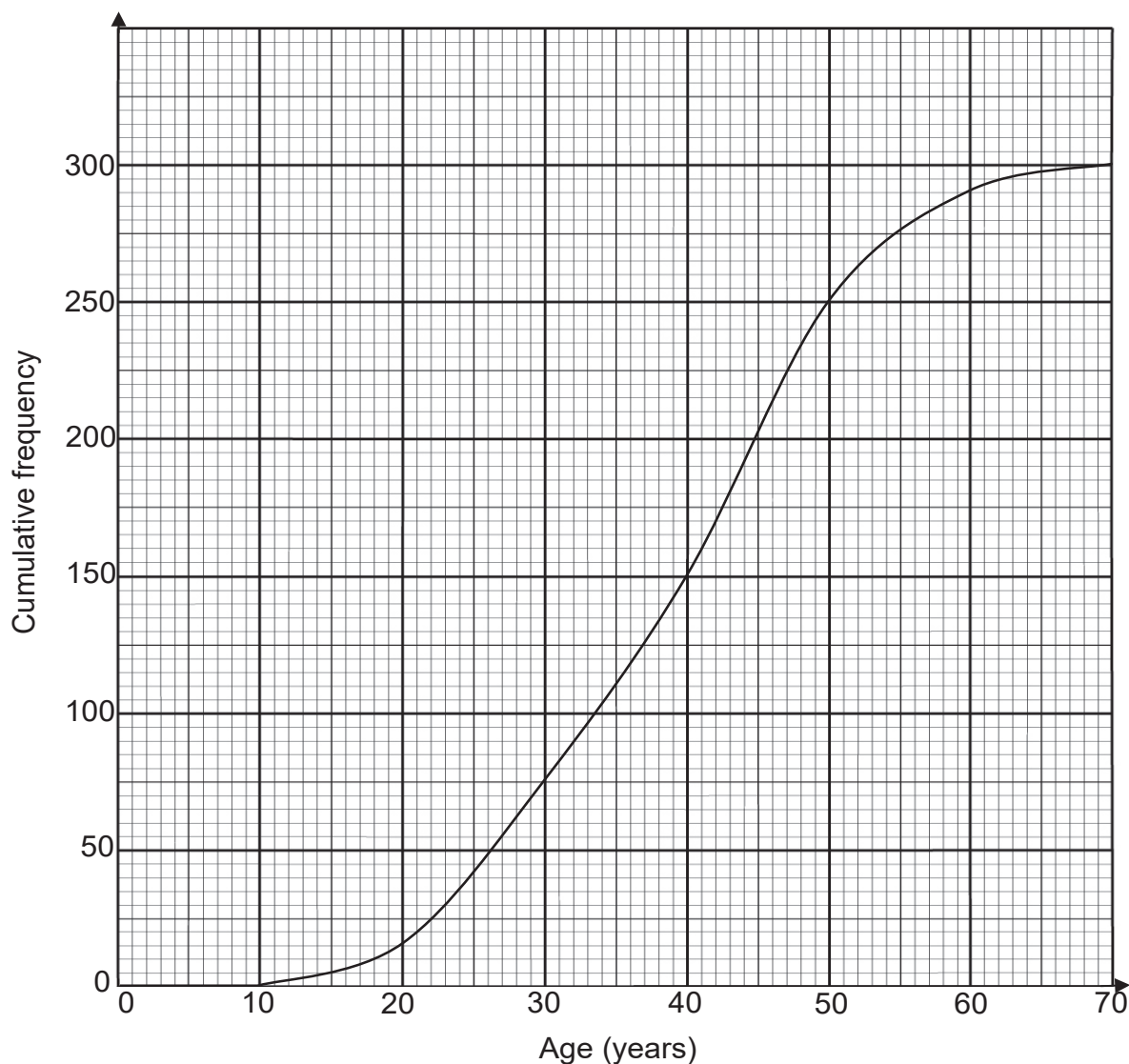
..... (3)

- (b)** Calculate the curved surface area of the storage tank.

..... (2)



21. The graph below shows the cumulative frequency curve of 300 people who were vaccinated against a certain disease at a community hall.



- (a) Using the graph, estimate the number of people under the age of 12 who were vaccinated.
..... (1)
- (b) Using the graph, estimate the **median** age of people who were vaccinated.
..... (1)
- (c) Using the graph, estimate the **80th percentile** age of people who were vaccinated.
..... (2)

(20 Marks)

22. Dimpho added **five** numbers, composed of a digit 8 only, to get a sum of 1000. A number may be added more than once.

$$\dots\dots\dots (2)$$

- What is the total number of eggs that were sold for P80.00?

..... (2)

- Write down the number KLM .

$$\dots\dots\dots (2)$$


25. A Postmaster packaged some boxes for delivery to a customer. He can only package either 10 small boxes or 8 large boxes at a time in a large container. A total of 96 boxes were packaged and sent in one delivery. Each container is to be filled to its maximum capacity and the number of small boxes should be less than the number of large boxes.

What is the total number of containers that will be fully filled up?

..... (3)

26. Kevin and his father took part in a bicycle challenge. When Kevin was 8 km away from the starting point, his father was 31 km away from the starting point. They then cycled at the same speed for 25 minutes. After the 25 minutes, the distance of his father was twice the distance of Kevin from the starting point.

How far was Kevin's father from the starting point, after the 25 minutes?

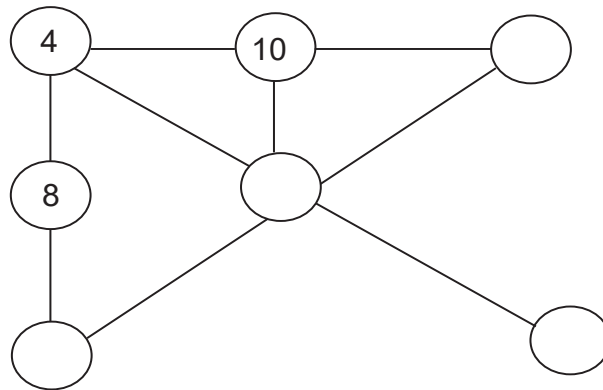
..... km (4)

- 27.** One third of a number is equal to five less than twice the number.

What is the number?

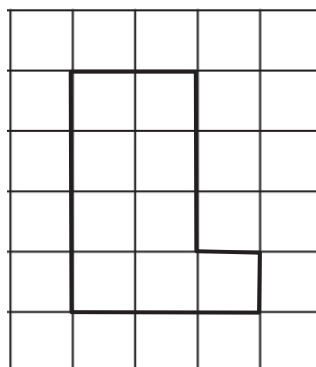
$$\dots\dots\dots (2)$$

- 28.** In the diagram below, place numbers in each circle such that the numbers in each straight line form a linear sequence.



(3)

- 29.** The diagram below shows a shape drawn on a grid with small squares. The area of each small square of the grid is 1 cm^2 . Divide the shape into rectangles with areas of 2 cm^2 , 3 cm^2 and 4 cm^2 .



[2]



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