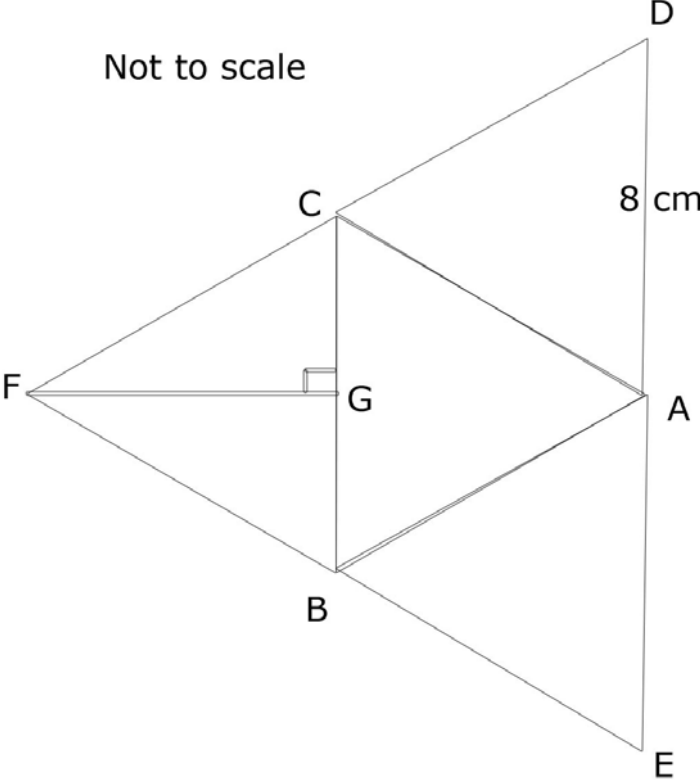


1. The diagram below shows 4 equilateral triangles joined together in to create a net. The distance AD is 8 cm.



a) Write the length of AC .

Answer cm [1]

b) Write the name of the triangle CFB .

Answer [1]

c) Use Pythagoras' theorem to find the length of FG .

Answer cm [2]

- d) Find the area of triangle CFG .

Answer cm^2 [2]

- e) Find the area of triangle CFB .

Answer cm^2 [1]

- f) Use trigonometry to find the angle labeled GFC .

Answer $^\circ$ [3]

- g) The points F , D , and E are joined together to create a 3D shape. Name the shape.

Answer [1]

2. A glass bottle has a mass of 600g and it contains 80 centilitres of water.

- a) Write 80 centilitres in litres.

Answer litres [1]

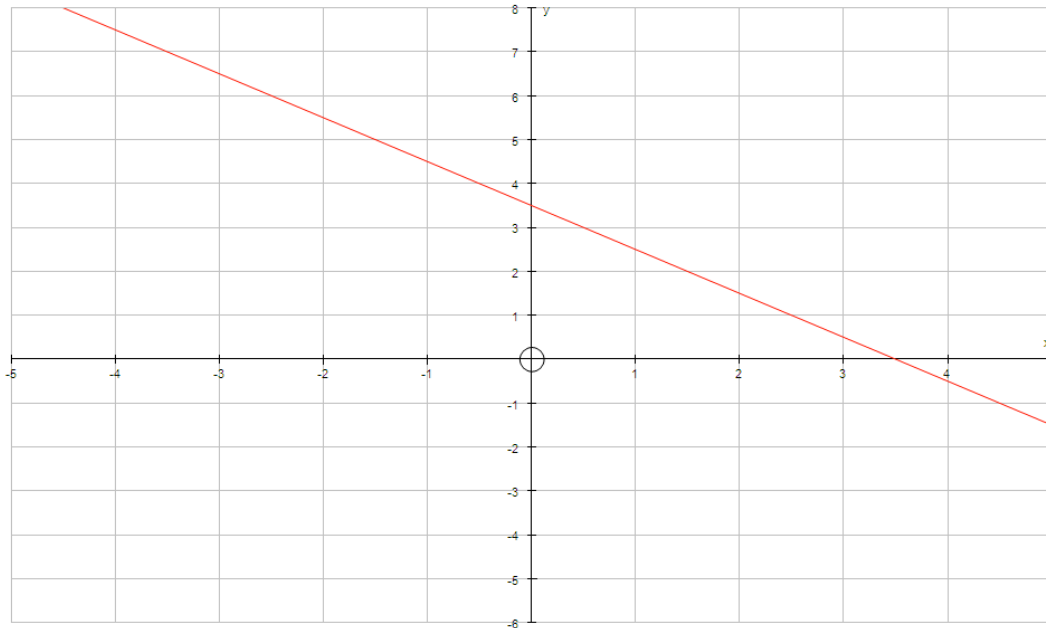
- b) Write 80 centilitres in millilitres.

Answer ml [1]

- c) The mass of 600g is correct to the nearest 50g. Complete the statement on the answer line below.

Answer $g \leq \text{mass} <$ g [2]

3. The graph of $2x + 2y = 7$ is drawn on the grid below.



a) Complete the table below to show the values of $y = \frac{1}{2}x + 2$.

x	-2	0	4
y	2

[2]

b) On the graph above draw of $y = \frac{1}{2}x + 2$ for $-5 \leq x \leq 4$. [2]

c) Use the graphs to solve the simultaneous equations,

Answer $x = \dots\dots\dots y = \dots\dots\dots$ [2]

d) Find the exact solutions of following simultaneous equations by use of algebra.

Answer $x = \dots\dots\dots y = \dots\dots\dots$ [4]

4. The diagram below shows 3 towns, Albertville, Barstow, and Cinqtown.

Albertville ●

● Barstow

● Cinqtown

Scale: 1cm = 3 km

- a) Find the distance from Albertville to Barstow.

Answer km [1]

- b) A major road is to be built so that it is equidistant from both Albertville and Barstow.

Using a straight edge and pair of compasses, draw on the diagram above the road. [3]

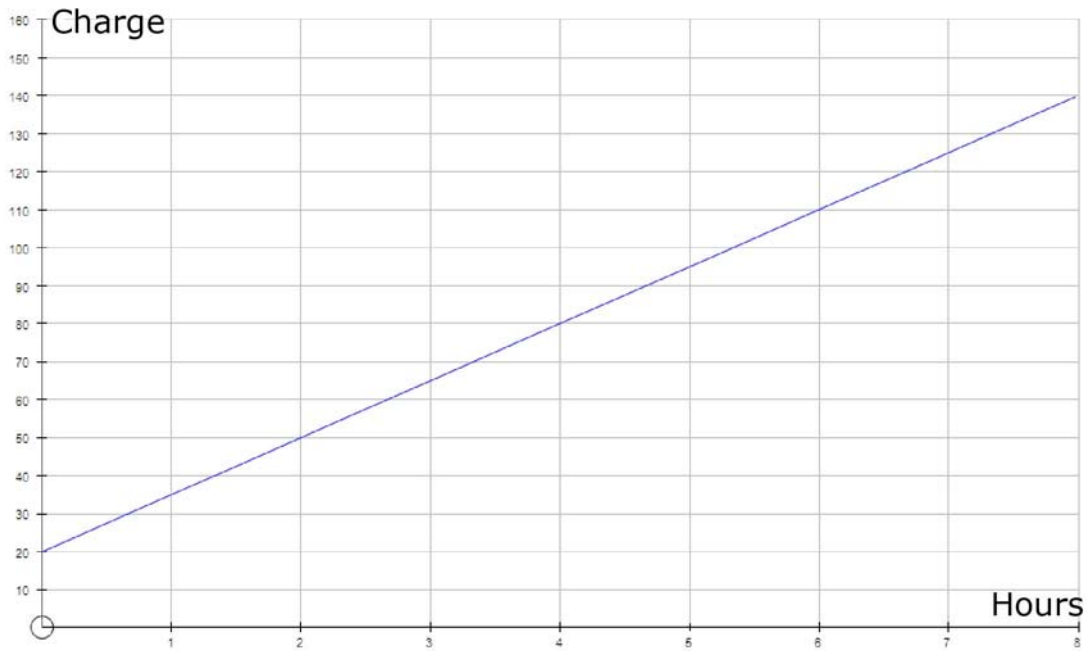
- c) Draw the locus of points that are 12 km from Cinqtown. [1]

- d) A junction is planned for the road such that it is as close as possible to Albertville and Barstow and only km from Cinqtown. Label the position of the junction with a *J* on your diagram. [1]

e) Write the scale 1cm = 3km in the form 1 cm = n cm.

Answer $n = \dots\dots\dots$ cm [1]

5. An electrician makes up his bill as a call out charge plus an hourly rate. He has drawn a graph to show his bill based on hours work.



a) What is the electrician's call out charge?

Answer \$ $\dots\dots\dots$ [1]

b) How much does the electrician charge for 3 hours work?

Answer \$ $\dots\dots\dots$ [1]

c) Write the equation of the line in the diagram above in the form $y = mx + c$.

Answer $\dots\dots\dots$ [2]

- d) The electrician estimates that he uses \$8 of materials for each hour worked.

Bill (\$)	Materials used (\$)	Profit (\$)
20	0	20
35	8	27
50		
65		
80		
95		
110		

[6]

6. a) A Fibonacci sequence is calculated by adding together the previous **two** terms. An example is given below.

1, 1, 2, 3, 5, 8, 13, 21, 34

Complete the first 7 terms of a Fibonacci sequence that starts with the numbers,

i) 2, 4, 6, , , ,

ii) 2, -3, -1, , , ,

[4]

- b) A tribonacci sequence is one that adds the previous **three** terms. An example is given below.

1,2,3,6,11,20,37,68

Complete the first 7 terms of a tribonacci sequence that starts with the numbers,

i) 1,1,1, , , ,

ii) 0, 3, -4, , , ,

[4]

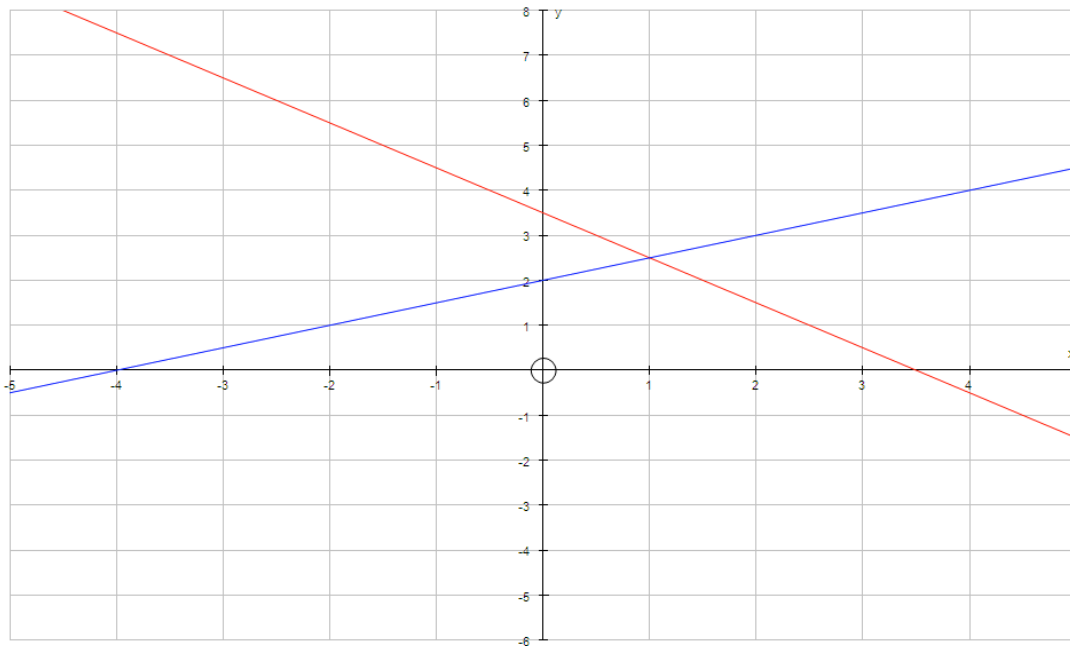
Answers

1.
 - a) 8 cm
 - b) Isosceles
 - c) 6.93 cm
 - d) 13.9 cm^2
 - e) 27.7 cm^2
 - f) 30°
 - g) Tetrahedron or a triangular-based pyramid.
2.
 - a) 0.8 litres
 - b) 800 ml
 - c) $575\text{g} \leq \text{mass} < 625\text{g}$

3. a)

x	-2	0	4
y	1	2	4

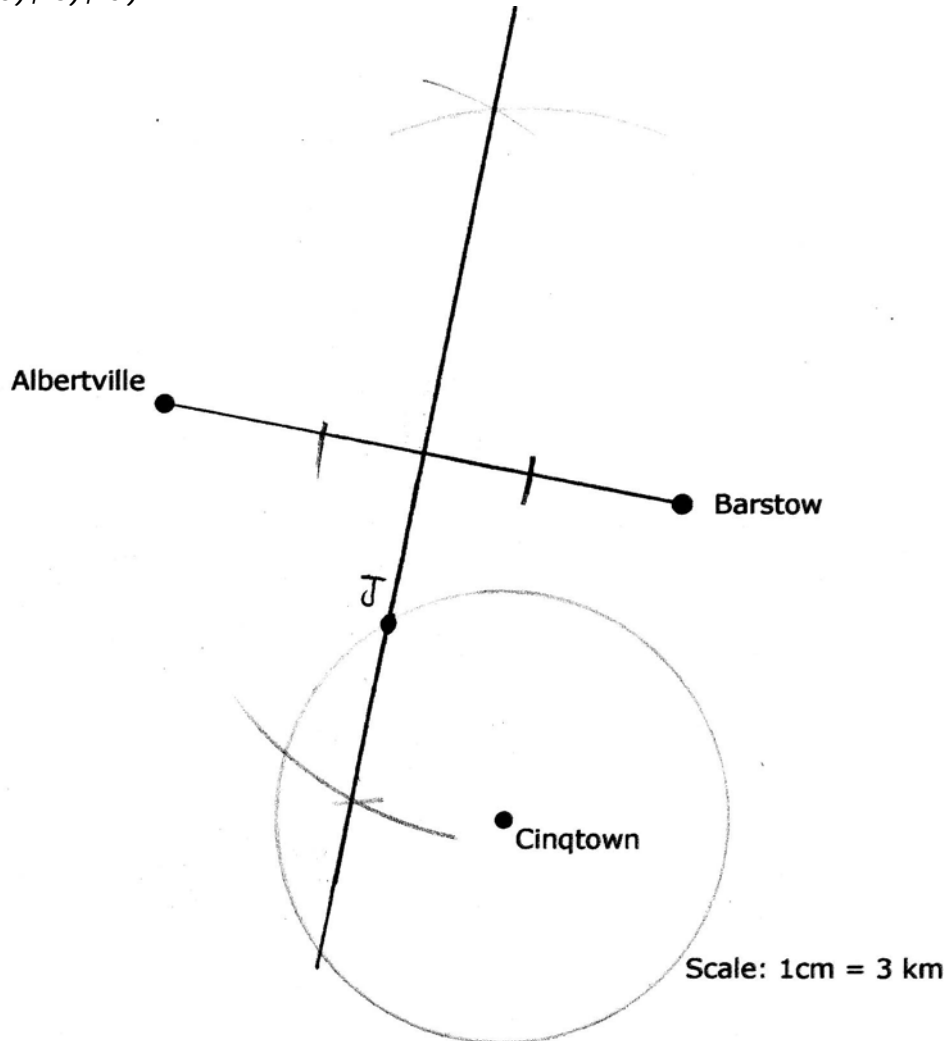
b)



c) and d) $x = 1, y = 2\frac{1}{2}$

4. a) 21 km

b), c), d)



e) $n = 300000$ cm

5. a) \$20
b) \$65
c) $y = 15x + 20$
d)

Bill (\$)	Materials used (\$)	Profit (\$)
20	0	20
35	8	27
50	16	34
65	24	41
80	32	48
95	40	55
110	48	62

6. a) i) 10, 16, 26, 42
ii) -4, -5, -9, -14
b) i) 3, 5, 9, 17
ii) -1, -2, -7, -10