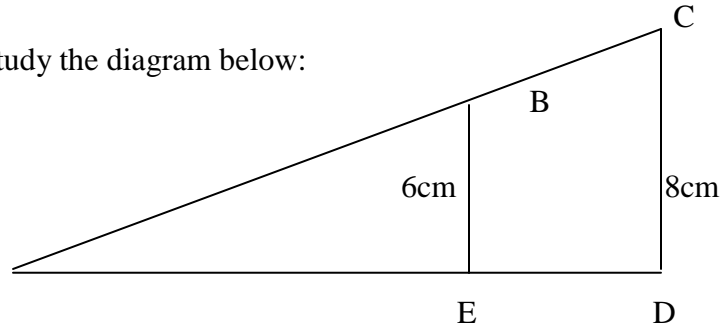


## S.2 HOLIDAY WORK TERM 3 2014

1. Study the diagram below:



If  $AD = 12$  cm, find the area of the region BCDE.

2. A and B are two sets such that  $n(\epsilon) = 38$ ,  $n(A \cap B) = 12$ ,  $n(A) = 25$  and  $n(A' \cap B') = 4$ . Find ;
- $n(A' \cap B')$ .
  - $n(B')$ .
3. (a) Factorize the expression  $5y^4 - 405$  completely.  
 (b) Without using tables or a calculator, evaluate;  
 $\log_{10} 7 - \log_{10} 35 + \log_{10} 5000$
4. A shopkeeper sells 7 kg of rice at shs 12,600. If the cost of rice then increased by 50 %, how much will 3 kg of rice cost?
5. (a) Determine the equation of the straight line passing through the points (2,7) and parallel to the line joining the point P(3,- 6) and Q (5, 4)  
 (b) P varies as q and inversely proportional to the square of r, and p=3 when r=2 and q=6. Find the value of q when p=-2 and r= -3
6. (a) Two bottles are similar ,the smaller bottle is 20 cm high and has a volume of 300cc. If the large bottle is 40 cm high, determine its volume  
 (b) In a mixed secondary school, the ratio of girls to boys is 5 : 9 .If there are 675 boys in the school ,determine the total number of students in the school.
7. (a) Without using tables or a calculator ,evaluate;  

$$\left(\frac{1}{125}\right)^{-\frac{1}{3}} \div \left(\frac{1}{8}\right)^{\frac{2}{3}}$$
 (b) Solve for m in the equation;  $(4)^{2m+2} = (2)^{m+13}$ .

8. a) Find the equation of the line passing through  $(-4, 1)$  and perpendicular to the line

$$y = \frac{x}{4} + 2$$

- b) Given  $\frac{x}{y} = 4$  and  $xy = 9$ , find the values of  $x$  and  $y$  that satisfy the two equations.

9. Given that  $\vec{OB} = \begin{pmatrix} 5 \\ -8 \end{pmatrix}$  and  $\vec{OA} = \begin{pmatrix} -16 \\ -36 \end{pmatrix}$ .

- (a) Determine the column vector for  $\vec{AB}$ .

- (b) Hence find the length of vector  $\vec{AB}$ .

10. a) Given that  $3^y \times 2^{x+2} = 72$ , find values of  $x$  and  $y$ .

- b) Evaluate  $\frac{\log_2 256}{\log_5 625}$  without using tables or calculators.

11. The table below shows the air temperature measured at hourly intervals during part of a day.

|  |    |    |    |    |    |
|--|----|----|----|----|----|
| <b>Time in hours a.m.</b>                          | 1  | 2  | 3  | 4  | 5  |
| <b>Temperature (<math>^{\circ}\text{C}</math>)</b> | 18 | 15 | 17 | 14 | 16 |

- (a) Represent the information on a bar graph below.

- (b) Calculate the;

- (i) mean  
(ii) median; temperature

12. a) Solve the equation  $3x^2 + 10x = 8$

- b) Without using tables or calculator evaluate  $7.46^2 - 2.54^2$

13. a. Using a ruler, a pencil and a pair of compasses only, construct a triangle BCD in which angle  $\text{DBC} = 60^{\circ}$ , angle  $\text{BCD} = 45^{\circ}$  and  $\text{BD} = 6$  cm.

- b. Drop a perpendicular from vertex C to meet line BD at a point A.

- c. Measure line AC and hence find the area of the triangle.

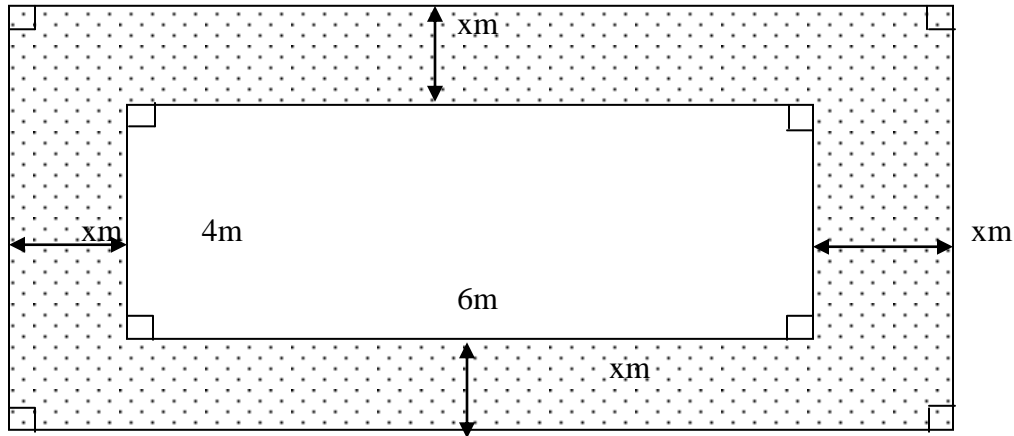
- d. Circumscribe a circle through triangle CAD.

14. A taxi driver drove at 80 km/hr for  $2\frac{1}{4}$  hrs and rested for 45 minutes. He completed the remaining journey of 240 km using the same speed.

- a. What distance did he cover before resting?

- b. Calculate his average speed for the whole journey.

15. The figure below shows a large room covered with a carpet leaving space of 2m wide from the wall all round.



- Given that the area of the room is  $80\text{m}^2$ , find the value of  $x$ .
  - Find the actual width of the room.
  - What is the actual length of the room?
  - Work out the area left uncovered (shaded area).
16. (a) State the solution set of the equation;
- $$\frac{y+1}{3} - \frac{2-y}{7} = 1$$
- If  $(x+y) : (x-y) = 8:3$ , find the ratio of  $x$  to  $y$
  - Solve for  $x$  in the inequality  $\left(\frac{x+1}{2}\right) - \left(\frac{x-3}{4}\right) < \left(\frac{x+2}{3}\right)$
17. Towers P, Q and R are such that Q is 500km on bearing of  $100^\circ$  from P and R is on a bearing of  $170^\circ$  from P and 800km away.
- Taking 1cm to represent 50km, construct an accurate diagram
  - Find the distance and bearing of R from Q