

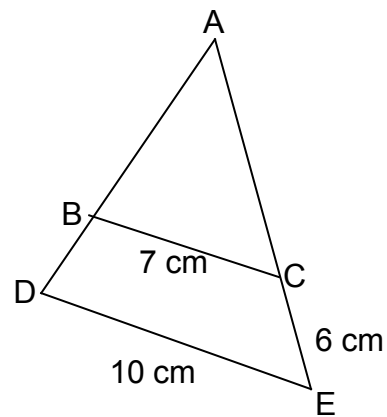
## S3 Credit - Homework 12

### Non-calculator section:

- Express as a single fraction  $4\frac{1}{2} - \frac{3}{4}$  of  $2\frac{1}{3}$
- $f(x) = 2x - 3x^3$ . find the value of  $f(-2)$ .
- Express  $P = \sqrt{u + at}$  in terms of  $t$ .
- (a) Simplify  $\sqrt{3}(2\sqrt{3} + \sqrt{6})$   
(b) Express  $\frac{\sqrt{5}}{\sqrt{40}}$  with a rational denominator in its simplest form.  
(c) Simplify  $a^{\frac{3}{2}}(3a^{\frac{7}{2}} + a^{-\frac{3}{2}})$

5. In the diagram opposite, triangles ABC and ADE are similar.  
BC = 7 cm, DE = 10 cm and CE = 6 cm.

Calculate the length of AC.



6. Express  $\frac{2}{x^2} - \frac{1}{3x}$   $x \neq 0$  as a single fraction in its simplest form.
7. Solve the inequation  $4 - 2(1 - 3x) < \frac{1}{2}(4x + 12)$

### Calculator section:

8. (a) The marks of 7 pupils in an advanced higher maths exam were

71 66 45 88 69 90 75

Calculate the mean and standard deviation of these marks.

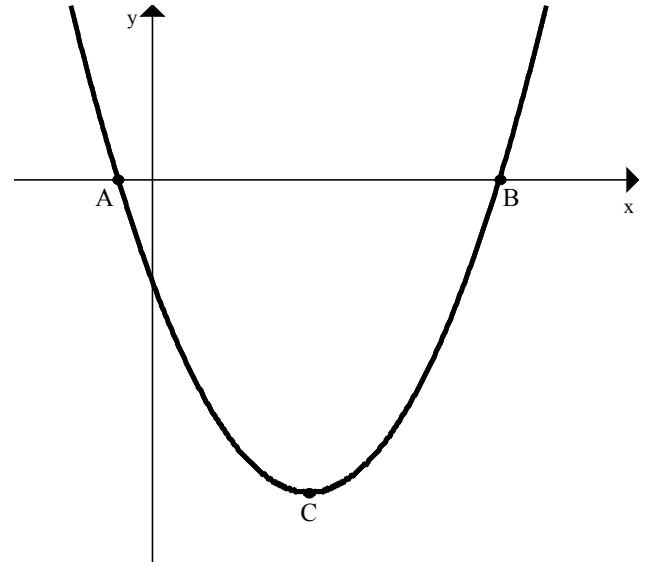
- (b) Another group of 7 pupils who sat the same exam had a mean of 78 and a standard deviation of 3.2.  
Make two comparisons of the marks of the two groups.

9. Solve the equation  $5 \tan 50^\circ + 3 \sin x^\circ = 5.1$  for  $0^\circ \leq x^\circ \leq 360^\circ$

10. Solve the pair of equations  $4x - 3y = 12$  and  $3x = 26 - 2y$

11. The diagram opposite shows the parabola with equation  $y = 2x^2 - 9x - 5$ .

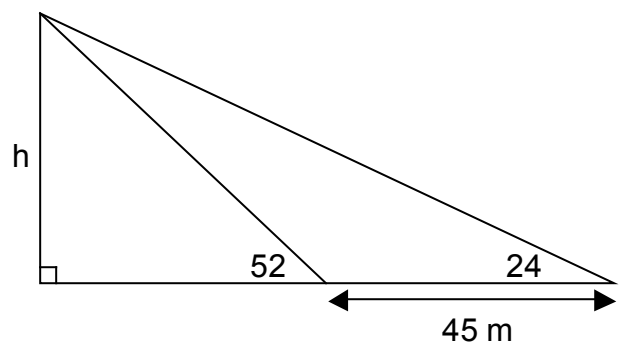
- (a) Find the coordinates of A and B.  
 (b) Find the coordinates of C.



12. The value of a boat decreased from £35 000 to £32 200 in one year.

- (a) What was the percentage decrease?  
 (b) If the value of the boat continues to fall at this rate, what would its value be after a further 3 years?

13. Calculate  $h$  in the diagram opposite.



14. The prisms opposite are similar in shape.

The smaller prism has volume  $300 \text{ cm}^3$ ,  
 Calculate the volume of the larger prism.  
**Give your answer correct to 3 sig. figs.**

