Credit Mathematics
Knowledge and Understanding

1. $f(x) = 3x^2 - 2x$.

   (a) Evaluate f(-3).
   (b) Given f(x) = 5, find two possible values for x.

2. Simplify

   (a) $(2a - b)^2 + 4ab$ (b) $(3x - 6)(x^2 + 2x - 1)$

3. Solve

   (a) $\frac{2x - 1}{3} - \frac{x}{2} = 1$ (b) $\frac{3}{4}(2x - 5) + 1 = x$

4. Factorise

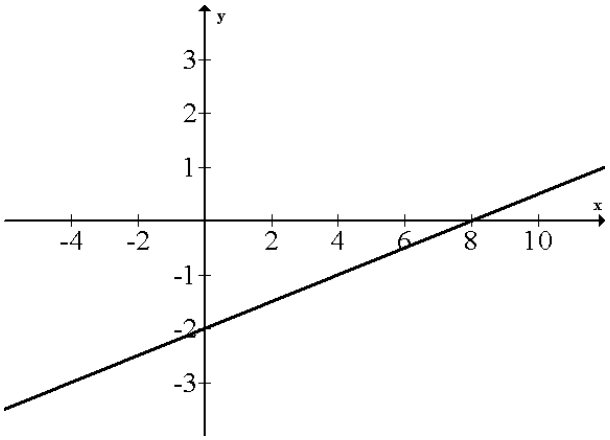
   (a) $2x^2 - 8$ (b) $5p^2 - 6p - 8$

5. Solve

   (a) $5m - 10m^2 = 0$ (b) $2x^2 = x + 15$

6. (a) Find the equation of the line shown opposite.

   (b) The point (-12,a) lies on this line. Find a.



7. Express $P = 3(x^2 - y)$ in terms of x.

8. Express as a single fraction

   (a) $\frac{1}{x} + \frac{3}{2x - 1}$ (b) $\frac{2}{5x} - \frac{1}{3x}$

9. Simplify $\sqrt{6}\left(2\sqrt{3} - 3\sqrt{6}\right)$

10. Express with a rational denominator $\dfrac{2\sqrt{3}}{\sqrt{18}}$

11. Simplify

(a) $\dfrac{3a^8 \times 6a^{-3}}{2a}$ (b) $2x^{\frac{1}{2}}\left(4x^{\frac{7}{2}} - x^{-\frac{1}{2}}\right)$

12. Solve the equation $x^2 - 2x - 10 = 0$ **giving your answers correct to 3 significant figures.**

13. The marks of 24 pupils in a test are shown below.

1	0 3 9
2	1 4 5 7 9
3	2 3 3 5 6 7
4	0 0 1 1 2 2 2 4 8 9

3 | 4 represents 34
n = 24

(a) Show this information in a boxplot.
(b) Find the semi-interquartile range of these marks.

14. The costs of a can of diet coke in 6 different shops are

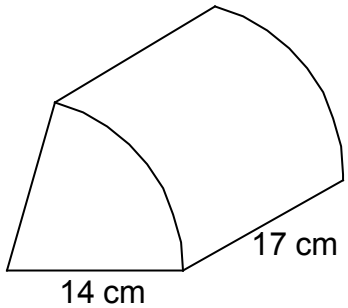
47p 49p 50p 44p 48p 44p

(a) Calculate the mean and standard deviation of these costs.
(b) Each shop increases the price of a can of diet coke by 4p.
Write down, **without working**, the mean and standard deviation of the costs now.

15. Niruz earns £26 500 per annum. She agrees a pay deal with her employer which will see her get a pay rise of 4.6% pa for each of the next 4 years.
What will Niruz earn in 4 years time?

16. A prism has a cross-section in the shape of the sector of a circle, radius 14 cm.

Calculate the volume of this prism.

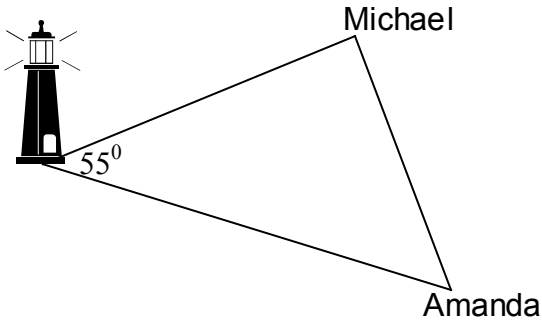


17. Solve the following equations for $0^0 \leq x^0 \leq 360^0$

(a) $5\cos x^0 + 1 = 0$ (b) $3\cos 40^0 + 6\tan x^0 = 12$

18. The diagram shows the directions walked by Amanda and Michael after they leave a lighthouse.
Michael walks at a speed of 3.8 kmph and Amanda walks at a speed of 4.4 kmph.

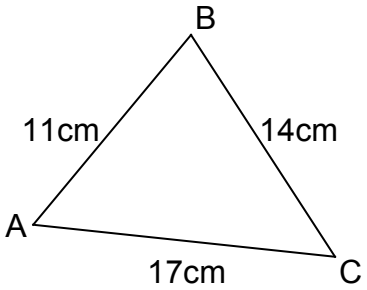
How far apart will Amanda and Michael be after 2 hours?



19. Triangle ABC has AB = 11 cm, BC = 14 cm and AC = 17 cm.

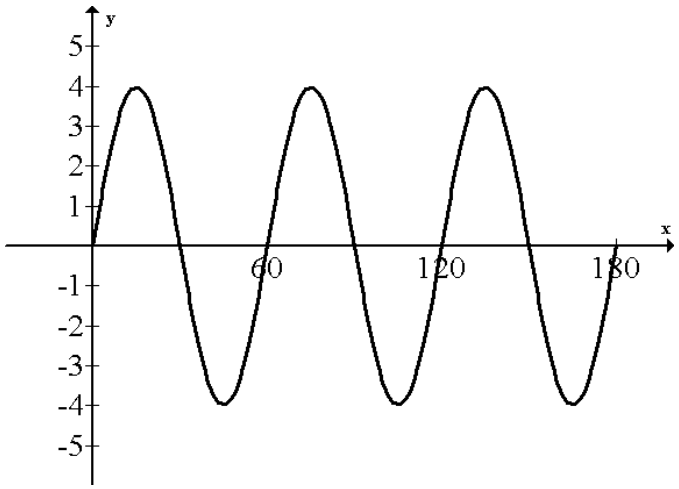
(a) Calculate the size of angle BAC.

(b) Hence find the area of the triangle



20. The diagram opposite shows part of the graph of y = asin bx.

Write down the values of a and b.



21. A multinational car making company made a loss of £2.55 x 10^8 in 2005.
Calculate the loss made by the company per minute.
Give your answer in Scientific Notation.

22. 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.