S3 Homework 9

Non-calculator section:

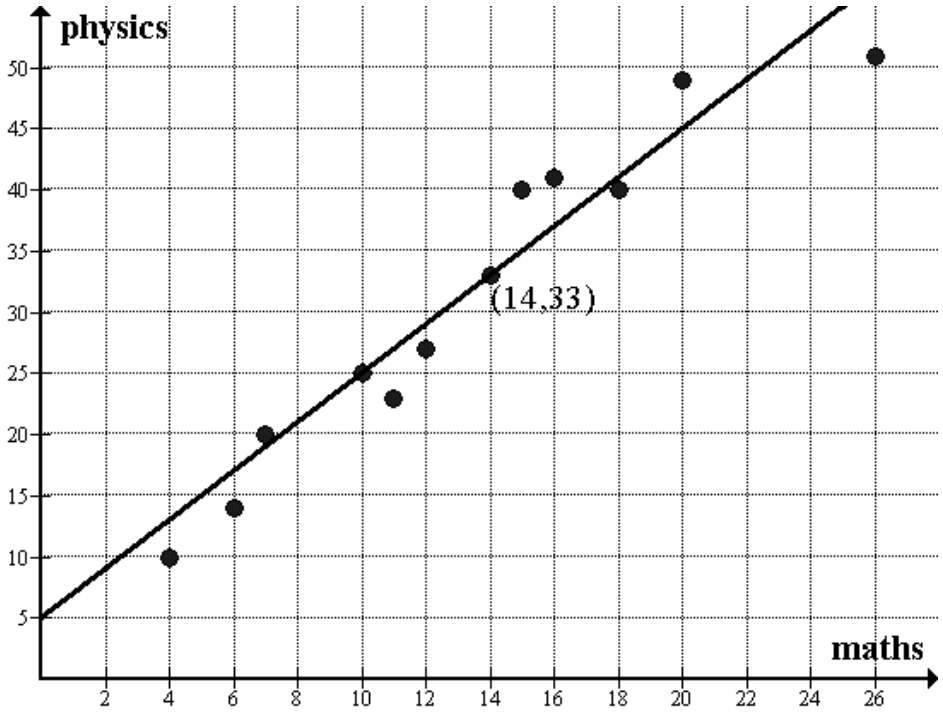
1. Express as a single fraction $(1\frac{2}{3})^2 - 2\frac{1}{2}$

2. $f(x) = 20 - 2x^2$.

   (a) Calculate f(-3)
   (b) Given f(x) = -12, find two values for x.

3. Express as a single fraction in its simplest form $\frac{6}{3x-4} - \frac{2}{x}$ $x \neq 0, \frac{4}{3}$

4. The scattergraph below shows the marks of 12 pupils in maths and physics tests.



A line of best-fit has been drawn on the diagram.

   (a) Calculate the equation of the line of best-fit.
   (b) Laura scored 23 in her maths test. Use your equation to estimate her physics mark.

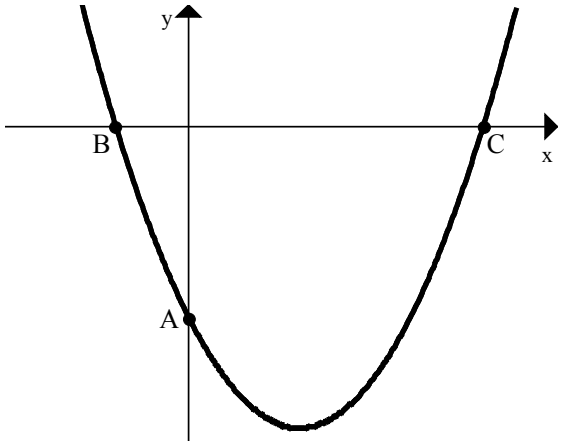
5. P varies as the square of Q and inversely as R.

   (a) Write down a formula connecting P, Q and R.
   (b) If Q is trebled and R is halved, what effect will this have on P.

6. The diagram opposite shows part of the parabola

$$y = x^2 - 6x - 16$$

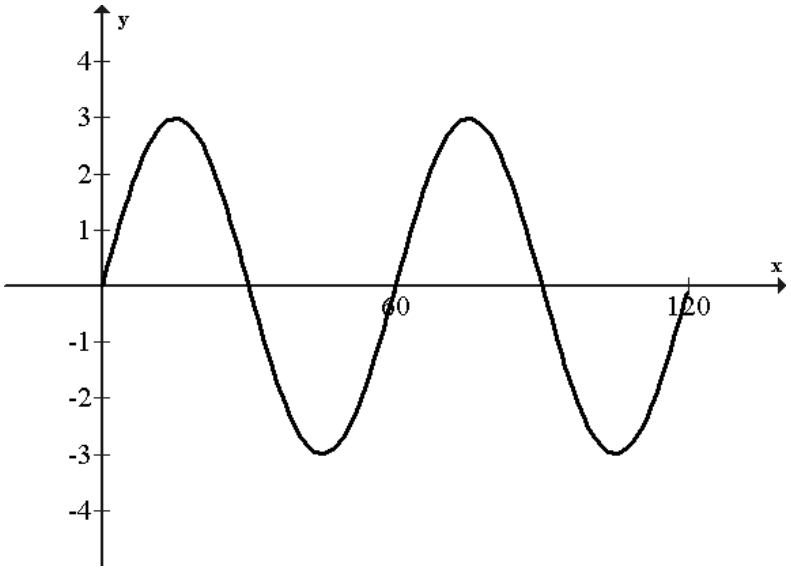
(a) Find the coordinates of A.
(b) Find B and C the roots of the parabola.
(c) Find the coordinates of the minimum turning point.



Calculator section:

7. Solve the equation $x^2 - 7x - 2 = 0$, **giving your answers correct to 1 d.p.**

8. The diagram below shows part of the graph of y = asin bx.



Write down the values of a and b.

9. In Astronomy, distances can be measured using different units. For example

1 parsec = 3.08×10^{13} kilometres and 1 Astronomical Unit = 1.49599×10^{8} kilometres

Calculate the number of Astronomical Units in one parsec.
Give your answer in Scientific Notation.

10. Calculate h in the diagram opposite.