Credit Mathematics – Homework E

Non-calculator section:

1. Express as a single fraction $1\frac{1}{4} \div 1\frac{7}{8}$

2. f(m) = 2m(3 – m^2). Find the value of f(-2).

3. Solve the inequation $6 - (x - 4) > 2(x - 1)$

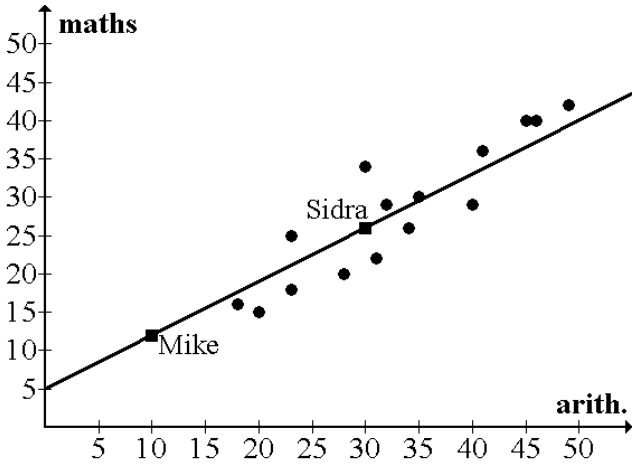
4. Express $H = \frac{1}{2}(P + Q^2)$ in terms of Q.

5. The scattergraph opposite shows the marks of 17 pupils in maths and arithmetic tests.

   Mike scored 10 for arithmetic and 12 for maths.
   Sidra scored 30 for arithmetic and 26 for maths.

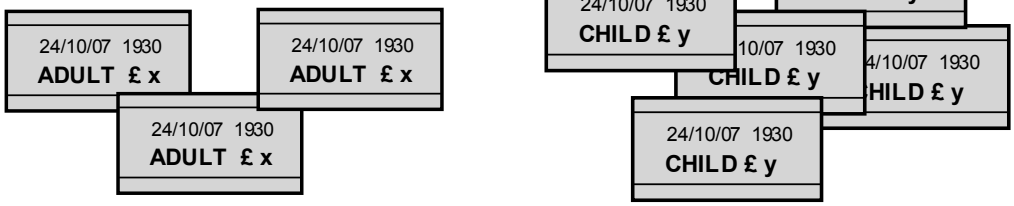
   A line of best fit has been drawn on the diagram.

   (a) Describe the relation between maths and arithmetic.
   (b) Find the equation of the line of best fit.
   (c) Amanda scored 50 for arithmetic, use your equation to estimate her maths mark.

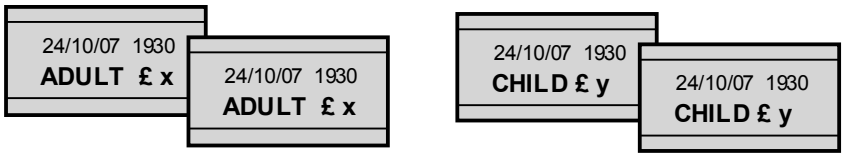


6. Tickets for the theatre cost differing amounts for adults and children.

   The following tickets are bought for a theatre visit.
   The total cost of the tickets was £60.



   The following tickets for the same theatre visit cost £32.



   Find the cost of an adult ticket and of a child ticket.

7. Simplify

   (a) $2\sqrt{20} + \sqrt{27} - \sqrt{500}$ (b) $\sqrt{3}(2\sqrt{3} + \sqrt{6})$

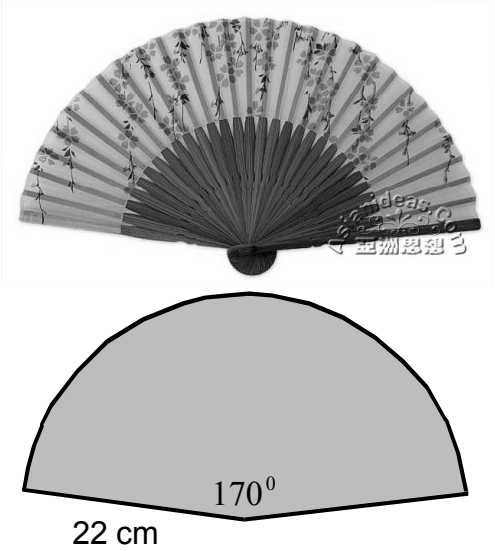
8. Express as a single fraction $\frac{2}{x} + \frac{1}{x-1}$ $x \neq 0,1$

Calculator section:

9. A triangle ABC has area 40 cm^2. AB = 12 cm, BC = 11 cm.
   Find two possible sizes for angle ABC.

10. In the year 2005, the oil company Esso posted operating profits of £1.82×10^{10}.
    Calculate the average profit made per second by Esso oil.
    Give your answer in Scientific Notation.

11. The diagram opposite shows a Japanese fan made from silk.

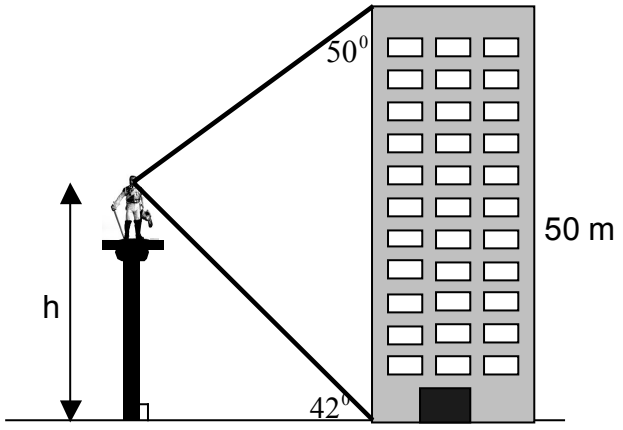


The fan is in the shape of the sector of a circle with radius 22 centimetres. When fully opened the angle at the centre of the fan is 170^0.

Calculate the area of the fan when fully opened.

12. A building, 50 metres high, overlooks a garden with a statue.
    From the roof of the building the angle to the top of the statue is 50^0.
    From the foot of the building the angle of elevation to the top of the statue is 42^0.

    Calculate, h, the height of the statue.



13. The diagram opposite shows the height, in metres, of a projectile above the ground after t seconds.
    The path of the projectile is given by

$$y = -2x(x - 10)$$

(a) How long was the flight of the projectile?
(b) Calculate the maximum height reached by the projectile.