Credit Mathematics – Homework K

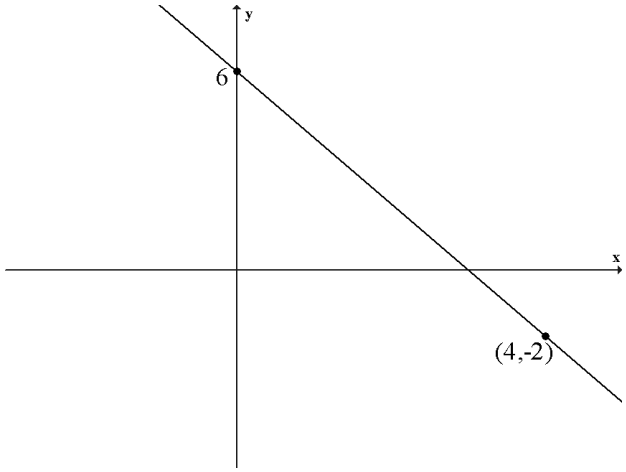
Non-calculator section:

1. Evaluate (a) $31.2 - 45.6 \div 60$ (b) $\frac{2}{5}$ of $1\frac{1}{3} - \frac{1}{2}$

2. $A = xy - 2x^2$. Calculate A when $x = -2$ and $y = -8$.

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

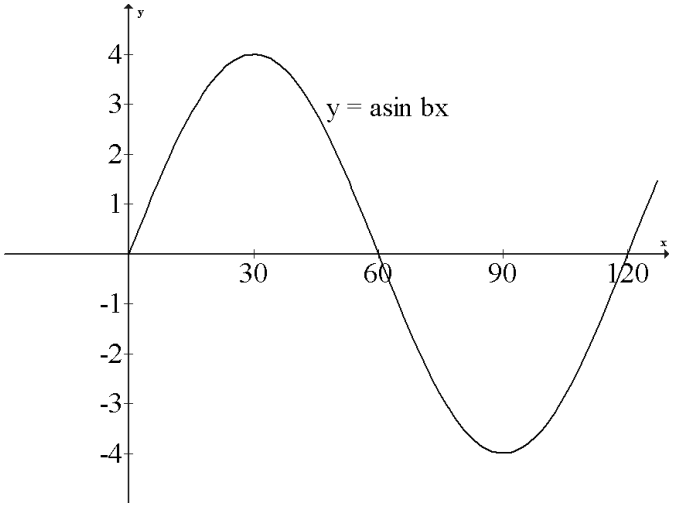
   (b) Find the coordinates of the point where this line cuts the x-axis.



4. Express as a single fraction $\frac{2}{3p} + \frac{1}{p-1}$ $p \neq 0,1$

5. The diagram shows the graph of $y = a\sin bx$.

   Write down the values of a and b.



6. Simplify $\frac{2a^2 - 8}{3a^2 - 5a - 2}$

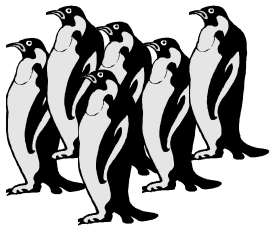
7. (a) Simplify $\frac{m^6 \times 8m^{-2}}{2m^3}$

   (b) (i) Simplify $2\sqrt{3}\left(3\sqrt{6} - 4\right)$ (ii) Express $\frac{\sqrt{3}}{2\sqrt{15}}$ with a rational denominator.

Calculator section:

8. Solve the equation $2\cos x + 5 = 4$ for $0 \leq x \leq 360$

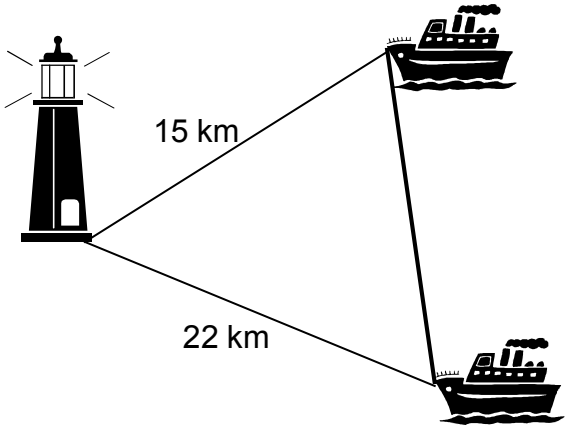
9. A colony of penguins contains 25 000 birds. The number of penguins in the colony is growing at a rate of 3.5 % per annum. How many penguins will be in the colony in 5 years time?
   Give your answer to the nearest thousand.



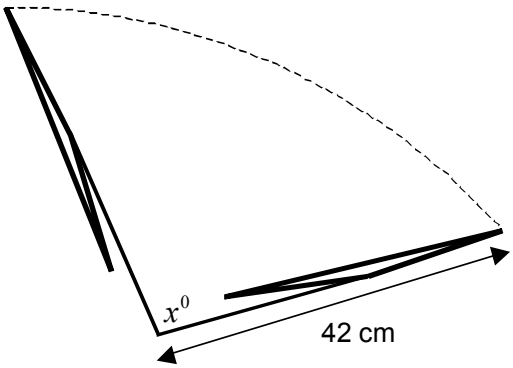
10. 2 apples and 2 bananas cost 82 pence.
3 apples and 5 bananas cost £1.69

Find the cost of 3 apples and 6 bananas.

11. From a lighthouse two ships can be seen out at sea.
One ship is on a bearing of 065^0 and is 15 km from the lighthouse. The other ship is on a bearing of 118^0 and is 22 km from the lighthouse.
Calculate the distance between the ships.

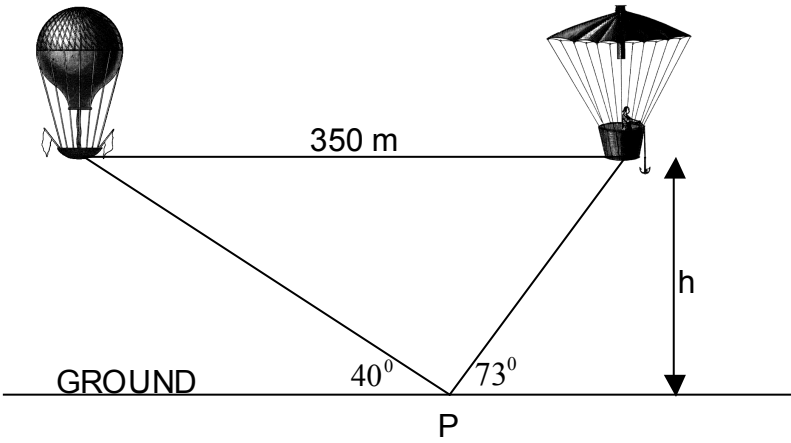


12. The diagram shows the path drawn out by a windscreen wiper blade.
The path is the arc of a circle of radius 42 centimetres. Given the length of this arc is 69.6 centimetres, calculate, x^0, the size of the angle the wiper turns through.
Give your answer to the nearest degree.



13. Two hot air balloons are the same height above the ground and are positioned 350 m apart, as shown.

Given the information in the diagram calculate h, the height the balloons are above the ground.



14. The diagram shows the parabola with equation

$$y = 7 - 6x - x^2$$

(a) Write down he coordinates of A.
(b) Find the coordinates of B and C.
(c) Find the maximum value of $y = 7 - 6x - x^2$.