Intermediate 2 – Homework 5

Non-calculator section:

1. (a) Multiply out the brackets and simplify $(2x - 1)(x^2 - 2x - 1)$

   (b) Factorise $3x^2 - 13x - 10$

2. The table below shows how a group of pupils is split in terms of boys and girls and which are left-handed or right-handed.

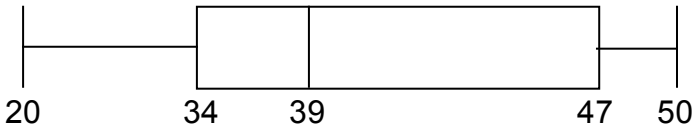
	Boys	**Girls**
Left-handed	**4**	**3**
Right-handed	**14**	**7**

   (a) What is the probability a boy selected at random is right-handed?
   (b) If these figures are representative of a larger group of 150 pupils, how many of this larger group would be right-handed girls?

3. The marks of 18 pupils in a test were

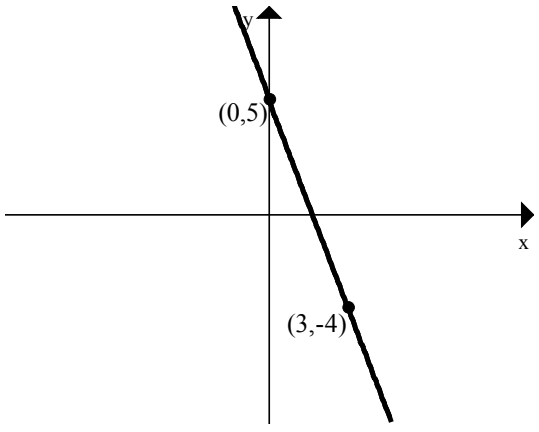
   26 35 35 42 19 35 26 35 44 40 24 45 34 56 59 11 55 34

   a. Find the median, lower and upper quartiles of these marks.
   b. Draw a boxplot to illustrate these marks.
   c. Another class of 18 pupils sat the same test. A boxplot of their marks is shown below.



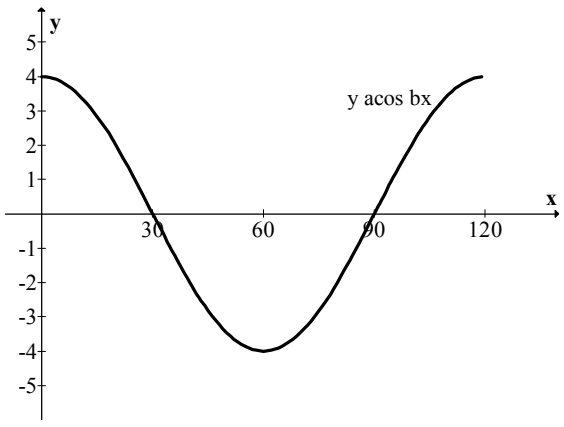
   Which class did better overall?

4. (a) Find the equation of the straight line opposite.



   (b) Does the point (-3,12) lie on this line?

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



   Write down the values of a and b.

6. Express as a single fraction $\frac{3}{x} - \frac{6}{2x + 1}$ $\quad x \neq 0, -\frac{1}{2}$

Calculator section:

7 . Solve the equation $4\sin x^0 + 3\tan 45^0 = 0 \quad 0 \leq x \leq 360$

8. Two brothers Peter and Gordon invested money in shares in 1997.
Peter invested £6500 and Gordon invested £4000.
Over the next 4 years Peter's shares fell in value at a rate of 7% per annum while Gordon's shares rose in value by 5.6% per annum over the same period.
Whose shares were worth more after 4 years?

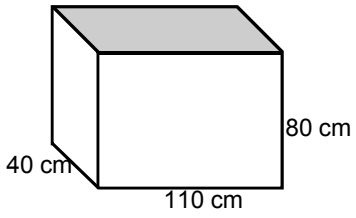
9. A group of adults and children are going to the cinema.
There are 14 people in the group.

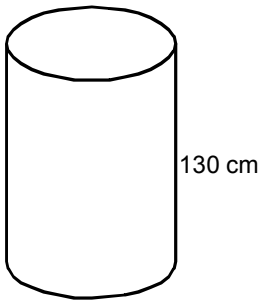
(a) Using x to represent the number of adults in the group and y to represent the number of children, write down an equation involving x and y.

(b) The tickets cost £6.50 for adults and £4.50 for children.
The total cost of tickets for the group is £71.
Write down another equation involving x and y.

(c) Calculate the number of adults in the group.

10. Jinder is having the water tank in her loft replaced.
The old tank is in the shape of a cuboid, 110 centimetres long by 40 centimetres broad and 80 centimetres high.
The new tank is in the shape of a cylinder 130 centimetres high.





The new tank has a volume 40% bigger than the old tank.
Calculate the radius of the new tank.
Give your answer correct to 3 significant figures.

11. A triangle PQR is shown opposite.
QR is 40 centimetres.
Angle PQR = 36^0 and angle PRQ = 58^0.

Calculate the distance d.