# Intermediate 2 – Homework 7

**Non-calculator section:**

1.(a) Expand the brackets and simplify $(3m - n)^2 + 6mn$.

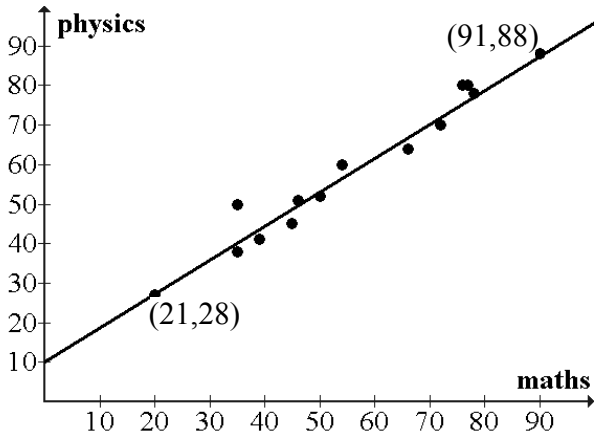
(b) Express the formula $T = \dfrac{ux + y}{w}$ in terms of x.

2. (a) Factorise $2x^2 - 7x - 4$ .

(b) Express as a single fraction $\dfrac{6}{2a - 1} - \dfrac{3}{a}$ $\quad a \neq \frac{1}{2}$ $\quad a \neq 0$.

3. The scattergraph opposite shows the marks of a group of pupils in maths and physics exams. David scored 21 in maths and 28 in physics. Kulvir scored 91 in maths and 88 in physics.

(a) Describe the relation between the maths and physics marks.
(b) Find the equation of the line of best-fit.
(c) John scored 63 in maths. Use your equation to estimate his physics mark.



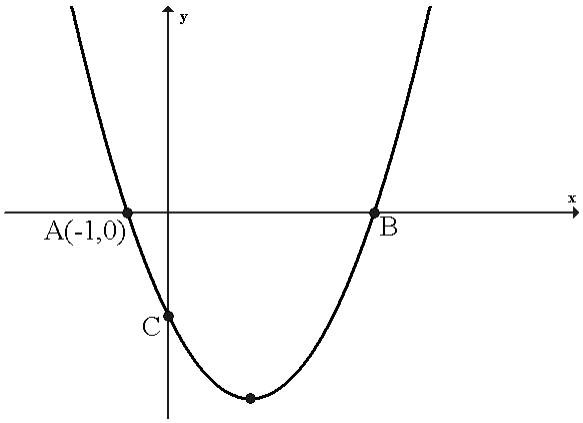

4. A group of pupils and teachers go to the theatre. There are 18 people in the group altogether.
   (a) Using x to represent the number of pupils and y to represent the number of teachers, write down an equation involving x and y.
   (b) The tickets cost £3 for pupils and £5 for teachers. The total cost of the tickets is £64. Write down another equation involving x and y.
   (c) Use your equations to find how many pupils are in the group?

5. (a) Simplify $x^{\frac{1}{2}}\left(2x^{\frac{5}{2}} + x\right)$.

(b) Express $\dfrac{6}{\sqrt{3}}$ with a rational denominator.

6. The equation of the parabola opposite is $y = (x - 2)^2 - 9$.

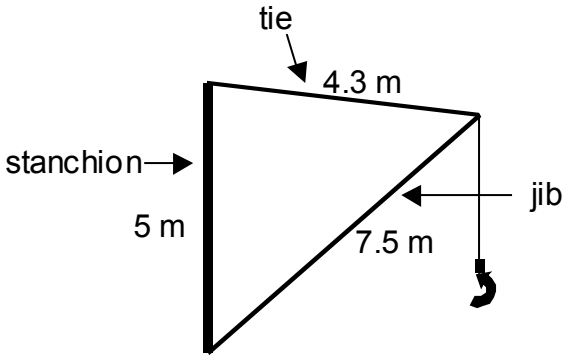
   (a) State the coordinates of the minimum turning point.
   (b) Find the coordinates of C.
   (c) A is the point (-1,0). State the coordinates of B.



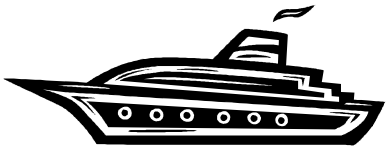
**Calculator section:**

7. A jib crane consists of a vertical stanchion 5 metres long, a jib 7.5 metres long and a tie 4.3 metres long.

   Calculate the size of the angle between the jib and the stanchion




8. A yacht costing £34000 is expected to depreciate at a rate of 4.8% per annum. Find the value of the yacht after 5 years.



9. The stem and leaf diagram below shows the marks of 20 pupils.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 5 | | | | |
| 2 | 0 | 4 | 9 | 9 | | | |
| 3 | 2 | 2 | 4 | 7 | 7 | 9 | |
| 4 | 0 | 0 | 0 | 1 | 4 | 5 | 5 |

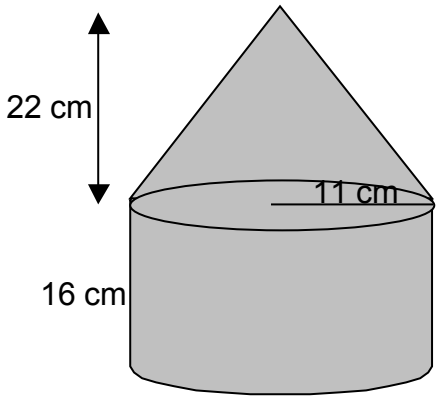
1 | 2 represents 12

   (a) Find the median mark.
   (b) Write down the lower and upper quartiles.
   (c) Show the information in a boxplot.

10. Solve the equation $x^2 - 7x - 2 = 0$ **giving your answers correct to one decimal place.**.

11. The solid opposite consists of a cylinder with a cone placed on top.

    Calculate the volume of this solid.




12. (a) The marks of 8 pupils in a French test were

    45 56 67 80 66 75 56 49

    Calculate the mean and standard deviation of the marks.

   (b) Due to the level of difficulty of the test each mark is scaled by having 10 added to it. Write down, without calculation, the new mean and standard deviation.