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 fully $2x^2 – 8x$.

   (b) Hence simplify $\dfrac{2x^2 - 7x - 4}{2x^2 - 32}$.

3. The scattergraph opposite shows the marks of a
    group of pupils in maths and physics exams.
    David scored 20 in maths and 27 in physics.
    Kulvir scored 90 in maths and 87 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.
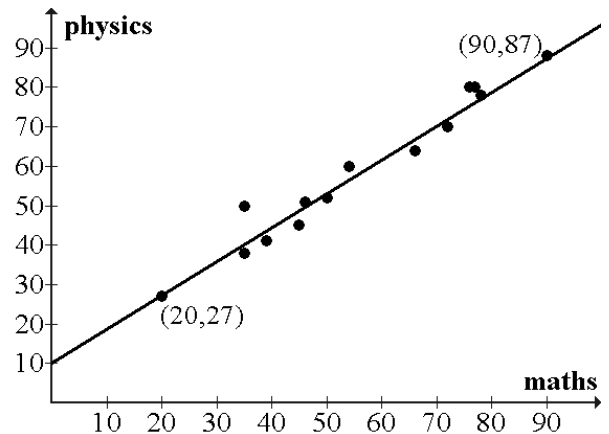
4. A group of pupils and teachers go to the theatre. There are 18 people in the group
   altogether.
   (a) Using x to represent the number of pupils and y to represent the number of
       teachers, write down an equation involving x and y.
   (b) The tickets cost £3 for pupils and £5 for teachers. The total cost of the tickets
       is £64. Write down another equation involving x and y.
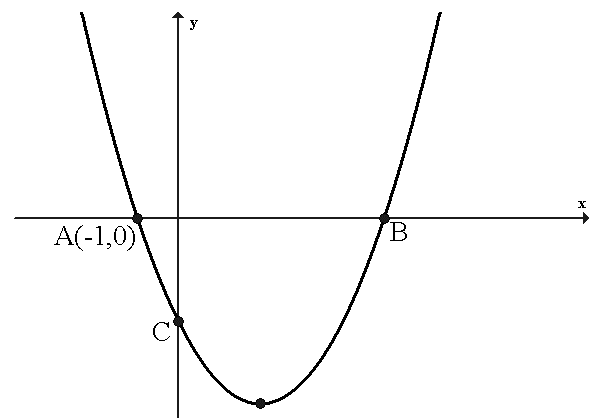   (c) Use your equations to find how many pupils are in the group?

5. (a) Simplify $\sqrt{50} + \sqrt{200} - 3\sqrt{8}$.

   (b) Express $\dfrac{\sqrt{3}}{\sqrt{15}}$ with a rational denominator.

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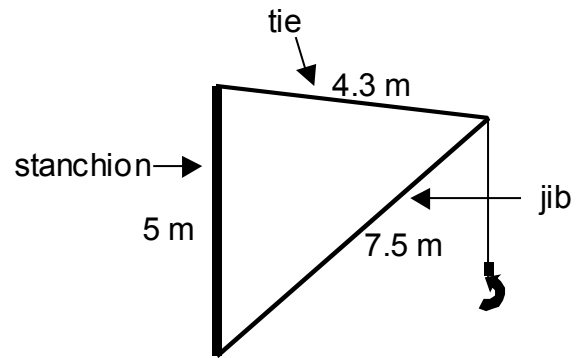 $y = (x – 2)^2 – 9$.

   (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
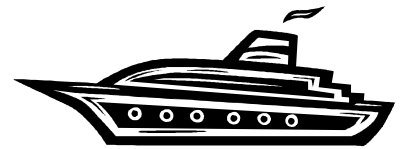   of B.

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

tie

4.3 m

stanchion→

5 m

7.5 m

jib

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.

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

10. Solve the equation $5\tan x + \sin 34° = 4$, $0 \le x \le 360$.

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

   Calculate the volume of this solid.

22 cm

11 cm

16 cm

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