Problem Set
Week Three and Four

1. The distance between $P_1 = (2, 3, 1)$ and $P_2 = (8, -5, 0)$ is…
2. Determine the equation of the straight line that passes through the point (– 1, 4) and has gradient of – 2.
3. Find the equation of the line joining (2,1) to (3,4).
4. Determine whether the lines $y = 2x + 3$ and $2y + x - 1 = 0$ are parallel or perpendicular.
5. Find the equation of the line passing through O and perpendicular to the line $3y = 4x + 2$
6. Find the equation of the line passing through (1,-1) and parallel to $y=3x-1$.
7. Find the equation of the straight line that passes through the point (2, -2) and inclined at 45° to the horizontal axis.
8. Determine the coordinates of the x and y-intercepts of the line $y = 4x - 8$.
9. State the coordinates of the midpoint of the line joining $A(-1, 4)$ and $B(3, 6)$.
10. The mid-point of the line joining P $(-2, 5)$ and R (a, b) is M (2, 1). Calculate the value of a and of b.
11. Find the point of intersection of the lines whose equations are $y=2x-3$ and $2y-x=0$.
12. A and B are the points (2, 5) and (6, 3) respectively (see Figure 5.6). Find:

    I. the gradient of AB

    II. the length of AB

    III. the midpoint of AB

    (iv) the gradient of the line perpendicular to AB.

13. The points P(2, 7), Q(3, 2) and R(0, 5) form a triangle.

I. Use gradients to show that RP and RQ are perpendicular.

II. Use Pythagoras' theorem to show that PQR is right-angled.

14. Sketch the lines

I. (a) $y = x - 1$ and (b) $3x + 4y = 24$ on the same axes.

II. Are these lines perpendicular?

15. Find the equation of the line perpendicular to $4y + x = 12$ which passes through the point P(2, −5).

16. The diameter of a snooker cue varies uniformly from 9mm to 23mm over its length of 140cm.

I. Sketch the graph of diameter (y mm) against distance (x cm) from the tip.

II. Find the equation of the line.

III. Use the equation to find the distance from the tip at which the diameter is 15mm.

~~17. Find the distance between the point and the line using the formula from today's lesson.~~

18. Given triangle ABC with vertices A(3,-1), B(2,2), and C(5,1)

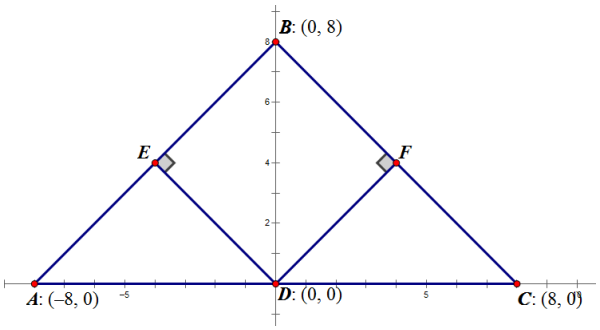
I. Find the slope of the angle bisector of angle ABC

II. Prove that the bisector of angle ABC is the perpendicular bisector of AC

III. Write the equation of the line containing BD

19. Use the distance formula to find the distance between the point P(-2,1) and the line y=2x.

20. Find the perimeter of quadrilateral DEBF shown below



21. Calculate the length of PQ, where P = (1,-1) and Q = (3,-5).

22. If P(1,-3) and Q(1/2,4), calculate the coordinates of the mid-point of PQ.

23. Given that A(2,3) and M(4,5), where M is the midpoint of AB. Find the coordinates of B.

24. State the gradient and y-intercept for the line 2y+8x-1=0.

25. A line cutes the y-axis at (0,5) and has a gradient of 4. State its equation.

26. Determine the equation of the line passing through the point (2,4) and whose gradient is 3.

27. Find the equation of the line passing through the point (2,-1) and which is parallel to the line with the equation, 2y+x-1 =0