Analysis - Semester 1 Exam REVIEW SHEET 2

1. What are the first five terms of the arithmetic sequence with a=5 and d= $-\frac{2}{3}$? Find the sum of the first 23 terms.

2. The first term of a geometric sequence is 5 and the common ratio is $-\frac{1}{2}$. Find the 10th term and the sum of the ten terms.

3. Prove by induction 2+4+...2n = n(n+1)

4. Find the parametric equations for the line through (1,-2) and (-4,-7). Assume the first point is (x_0, y_0) .

5. Find the vector equation of the line through (3,4) and (0, -2).

6. Find the distance between the points (2,0,1) and (10,1,5).

7. Can a line in space have direction angles $\frac{\pi}{3}$, $\frac{\pi}{4}$, and $\frac{\pi}{3}$?

8. Find the parametric equations for the line through (2,4,0) and (4,0,5) Use the first point as (x_0, y_0, z_0) . Find another point on the line.

9. Find the intercepts of the plane x-y+2z=3. Sketch the plane.

10. Find the vector equation of the line through (3, -2, 4_ and (-1, 3,7).

11. Parametric equations of a plane are x=1+s+t, y=2-s+t and z=4+2s-3t. What is the rectangular equation of the plane?

12. Find the dot product of $2\vec{i} + 3\vec{j} + 4\vec{k}$ and $\vec{i} - \vec{j} - \vec{k}$.

13. Find the distance from (1,3) to 3x-2y+12=0

14. $(\vec{i} + \vec{j} - \vec{k}) \times (2\vec{i} - \vec{j} + \vec{k})$

15. Use cross product to find the area of the triangle through (0,0,0), (1,1,1) and (0,0,3)Answers: 1) 5, $\frac{13}{3}$, $\frac{11}{3}$, 3, $\frac{7}{3}$; $\frac{-161}{3}$ 2) $\frac{-5}{512}$; $\frac{1705}{512}$ 4) $x = 1 - \frac{d}{\sqrt{2}} y = -2 - \frac{d}{\sqrt{2}}$ 5) $r = -2\vec{j} + t(3\vec{i} + 6\vec{j})$ 6) 9 7) Yes8) $x = 2 + \frac{2d}{3\sqrt{5}} y = 4 - \frac{4d}{3\sqrt{5}} z = \frac{5d}{3\sqrt{5}}$ 9) $x=3 y=-3 z=\frac{3}{2}$ 10) $r = 3\vec{i} - 2\vec{j} + 4\vec{k} + t(-4\vec{i} + 5\vec{j} + 3\vec{k})$

11) x+5y+2z=19 12) -5 13) $\frac{9}{\sqrt{13}}$ 14) $-3\vec{j} - 3\vec{k}$ 15) $\frac{3\sqrt{2}}{2}$