Review of 3D Graphing Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I. On the 3D graph to the right: z axis

 A) Label the y and z axes as given

 by the right hand rule.

 B) Mark units on all three axes ranging A

 from -3 to 5. Space them as evenly as y axis

 you can. (in blue)

 C) Plot points A:(2, 3, 4) , B: (0, -2, -4) C

 And C: (-1, 4, -3). B

 D) What is the midpoint of AB? (1, ½, 0) x axis

 E) Name 3 noncollinear points on the plane y = 5. (2, **5**, 8), (1, **5**, 1), (0, **5**, -4)

 F) What is true of any line parallel to the x axis? The y and z values are constant, but the

 x value will vary. (ex. Points will be (1, 4, 5), (5, 4, 5), (-3, 4, 5)) and it’s ⊥ to the YZ plane.

 G) What is true of any plane parallel to the xy plane? It will have equation z = k for some

 constant k.

 H) What is true of any line perpendicular to the xz plane? It will be parallel to the y axis

 and the points will have the form: (a, y, b) for constants a and b and y∈ R.

 I) What is true of any plane perpendicular to the y axis? It will have equation y = k for

 some constant k.

 J) Find the length of BC. 

 K) What are the intercepts of the plane 2x – 6y + 3z = 12 ? (6, 0, 0), (0, -2, 0) and (0, 0, 4)

 L) The plane 4x – 7z = 3 is parallel to something. What is it? The y axis.

 M) Describe the location of the plane z = 3. 3 units above the xy plane and parallel to it.

 N) Write the equation of the plane through A, B, and C. 43x + 10y – 17z = 48

 O) Write a plane parallel to x – 6y + 3z = 8 if the point (4, -2, 8) lies on it. x – 6y + 3z = 40

Classify these as “sometimes”, “always” or “never” true.

 \_Sometimes\_P) If 2 planes are perpendicular to a third plane, they are parallel to each other.

 Sometimes \_ Q) If If 2 lines are perpendicular to a third line, they are parallel to each other.

**Some Simple Extensions:**

II. On the 3D graph to the right: <-2, -4, 3> z axis

 A) Label the y and z axes as given

 by the right hand rule.

 B) Mark units on all three axes ranging

 from -3 to 5. Space them as evenly as y

 you can.

 C) Draw position vectors OP = <2, 4, -1> <2, 4, -1>

 and OQ = <-2, -4, 3>.

 x axis

 D) What would be the sum of OP + OQ? < 0, 0, 2 >

 E) Find |OP|.

 

 F) Predict what you think OP **** OQ would be. 2(-2) + 4(-4) + (-1)3 = -4 - 16 – 3 = -23

 G) Write PQ. <-4, -8, 4>

 H) Find | OQ | \_\_\_ and | PQ | = \_

 I) Use this information to find m∠POQ.

 By the law of cosines,



Can you think of another way to solve this problem???