**1.**

Let a = 2i + 3j and b = -9i + 6j. Find c = a – b.

A) c = -3j
B) c = 9i
C) c = 11i + 9j
D) c = 11i – 3j

**2.**

Let a = 2i + 3j and b = -9i + 6j. Find d = a • b.

A) 36
B) -36
C) 0
D) -18i2 + 18j2

**3.**

Find the intersection of L1: x – 2 = ½(y + 1) = 1/3(z – 3), L2: 1/3(x – 5) = ½(y – 1) = z – 4, if they intersect.

A) (-1, 2, -3)
B) (0, 0, 3)
C) (2, -1, 3)
D) They do not intersect

**4.**

What can we say about the plane with n = (7, 11, 0)?

A) It’s perpendicular to the x-y plane
B) It’s the x-y plane
C) It’s parallel to the x-y plane, but offset by units along the z-axis
D) It’s parallel to the x-y plane, but offset by units along the z-axis

**5.**

What can we say about L: x = 7 – 4t, y = 3 + 6t, z = 9 + 5t and *P*: 4x + y + 2z = 17?

A) They are orthogonal
B) L is co-planer with *P*
C) L and *P* are parallel
D) L intersects *P* at a angle relative to the z-axis

**6.**

Convert the following into spherical coordinates: x2 + y2 + z2 = 36

A)   radians
B) (6, 0.6, )
C)  = 6
D) None of the above

**7.**

What is the angle between these two planes: x + 2y – z = 13 & -2x – 4y + 2z = -13?

A) 
B) 
C) 
D) 

**8.**



A) 
B) 
C) 
D) There is no way to know without knowing f(x,y) first

**9.**



A) r
B) 
C) 
D) 

**10.**



A) 384 t 7
B) 8 t 8
C) 1024 t 7
D) 64 t 5

**11.**



A) (x + z) exp(yz + xz + xy)
B) (x + z) exp(-yz - xz - xy)
C) (x + z) exp[y(x + z)]
D) exp(yz + xz + xy)

**12.**



A) 0
B) Cannot be differentiated
C) 108w2
D) None of the above

**13.**

There are two extrema for z = 2x – x2 + 2y2 – y4. One is located at (1, 1, 2). Where is the second one located?

A) (-1, 1, 2)
B) (1, -1, 2)
C) (1, 2, -1)
D) There is no second extreme point

**14.**



A) Q defines a minimum
B) Q defines a maximum
C) Q defines a minimum or a maximum
D) None of the above

**15.**

denotes:

A) The full derivative of f
B) *For all* f
C) A partial derivative of f with respect to some variable
D) The gradient vector of f

**16.**



A) 
B) 
C) 
D) 