Advanced Engineering Mathematics, by Erwin Kreyszig 10th. Ed.

**Problem Set 9.2**

1-10



No. 1







No. 2











No. 3











No. 4





From problem 3( a), ,





No. 5



(b)

(b) From prob. 3(b) and (c),, 



No. 6









From prob. 3(a) and (c),, 



No. 7







No. 8

From prob. 1(a) 



No. 9

(a) [From 1(a),]

 [From 7(a),]



(b) [From 5(a),

]

No. 10

(a)



(b)



No. 11

Prob. 1: symmetry

Prob. 4: triangle inequality

Prob. 5: triangle inequality

Prob. 6: parallelogram equality

Prob. 7: Cauchy-Schwarz inequality

No. 12



If  Implies nothing

If then  Implies (i)and  are orthogonal, (ii), or (iii) ,are perpendicular torespectively

No. 13



 ()

No. 14

1. Cauchy-Schwarz inequality  

 [From 3(a)and (b)]



1. Triangle inequality  

 [From 4 (b)]



No. 15













No. 16





Since  

And therefore 

No. 17





Work 

No. 18





Work 

No. 19





Work 

No. 20





Work 



No. 21



26-30



No. 22

Find the angle between  and 







No. 23

Find the angle between  and 







No. 24

Find the angle between  and 













No. 25

Find the angle between  and  as n becomes larger and larger





i.e. and will approach the same direction

The angle between will approach 0°

No. 26





α





No. 27

Setand 

 



And 

Therefore 

γ

α

β

No. 28

B

A C

 

 

 

  













No. 29

C:(2, 3) D:(8, 3)

A:(0, 0) B:(6, 0)

 

 

 

 





















No. 30

‧

P

A‧

If a point P :(x, y, z) at the plane, then



And the unit normal to the plane 

The distance from A to the plane is





No.31

Since and  are orthogonal



 



No. 32

The normal vectors of the planes are and respectively

 

 

No. 33

Since is a unit vector, 

And 

 Thus 

No. 34

If the incident ray propagates in the direction as 

Assume it first hit xy-plane, the reflected ray directs in 

Then hit yz-plane, it reflects in the direction of 

Finally the ray reflected by xz-plane, it will have the direction parallel to 

Thus the reflected ray is in the direction of.

No. 35













When, the diagonals will orthogonal.

Find the component of in the direction of 

No. 36





No. 37





No. 38





No. 39

Since





No. 40

Nothing