**S5 CORE MATHEMATICS COMPREHENSIVE ASSESSMENT 2020 MARKING SCHEME**

Answer 1 **a) 4marks**

a) Since the light is traveling from a rarer region (lower

n) to a denser region (higher n), it will bend toward the

normal.

**Answer b 6marks**

 We will identify air as medium 1 and the fiber as

medium 2. Thus, n1=1.00 (index of air), n2 =1.44 and













Answer 2 5marks





So  diverges

answer 3

**.**F:student is female P(F)=0,55

M:student is male P(M)=1-0,55=0,45**/**

Full: student is fulltime P( Full)=0,65

a)P(Student is part-time)=1-0,65=0,35**/ 5marks**

b) Given that 35%are male,Full-time students P(M$\bigcap\_{}^{}Full$)= 0,35**/ 5marks**

Also P(Full)= P(M$\bigcap\_{}^{}Full)+P(F\bigcap\_{}^{}Full)$

 =0,35+P(F$\bigcap\_{}^{}Full)$

P(F$\bigcap\_{}^{}Full)=0,30$

P(F)=P(F$\bigcap\_{}^{}Full)+P(F\bigcap\_{}^{}Part)$

0,55=0,30+P(F$\bigcap\_{}^{}Part)$

P(Female and Part-time)=0,25

Answer 4 5marks





**answer 5**

Nth term of A, P is given by

$an=a+\left(n-1\right)r$

13th term $a+12r $/

7th term a+6r =3(a+5)

$\left\{\begin{array}{c}a+12r=27\\-2a+3r=0 \end{array}\right.$

27r=54

$r=\frac{54}{27}=2$

 r=2 is common difference 5marks

$a+12.2=27 $

a= 27-24 = 3 a=3 is the 1st term 5marks

S10=$\frac{n(2a+\left(n-1\right)r)}{2}$ Sum of the first ten term, S10= $\frac{10(2.3+\left(10-1\right).2)}{2}=\frac{60+180}{2}=\frac{240}{2}$

S10 =120 / 5marks

Answer 6)$ 2^{x-1}-2^{x-3}=2^{3-x}-2^{1-x}$ 10marks

$2^{x}.2^{-1}-2^{x}.2^{-3}=2^{3}.2^{-x}-2^{1}.2^{-x}$

$\frac{2^{x}}{2}-\frac{2x}{2^{3}}=\frac{2^{3}}{2^{x}}-\frac{2}{2^{x}}$ /

$2^{x}\left(\frac{1}{2}-\frac{1}{8}\right)=(8-2)\frac{1}{2^{x}}$

$2^{x}.\frac{3}{8}=\frac{6}{2x}$

$3.2^{x}.2^{x}=48$

3$2^{2x}=48$

$2^{2x}=\frac{48}{3}$

$2^{2x}=16$

$2^{2x}=2^{4}$

$2x=4$

 x= 2

**Answer 7 5marks**

Centre of sphere is (2,1,−1) and its radius is *r* = 37 .

The distance between the centre of the sphere and the

given point is 



Here *d* . Thus, the point lies outside the sphere.

**Answer 8 10marks**

**( 10marks)**



 =1x1



**answer 9**

1. **4marks**





**b)6marks**





**answer 10)**

 a) Complete the table below **(15marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | () |
| 3 | 2 | -4 | -2.6 | 10.4 |
| 5 | 3 | -2 | -1.6 | 3.2 |
| 6 | 4 | -1 | -o.6 | 0.6 |
| 8 | 6 | 1 | 1.4 | 1.4 |
| 9 | 5 | 2 | 0.4 | 0.8 |
| 11 | 8 | 4 | 3.4 | 13.6 |
|  |  |  |  |  |
|  |  |  |  |  |

b)The Covariance of  and  or **(5marks)**

