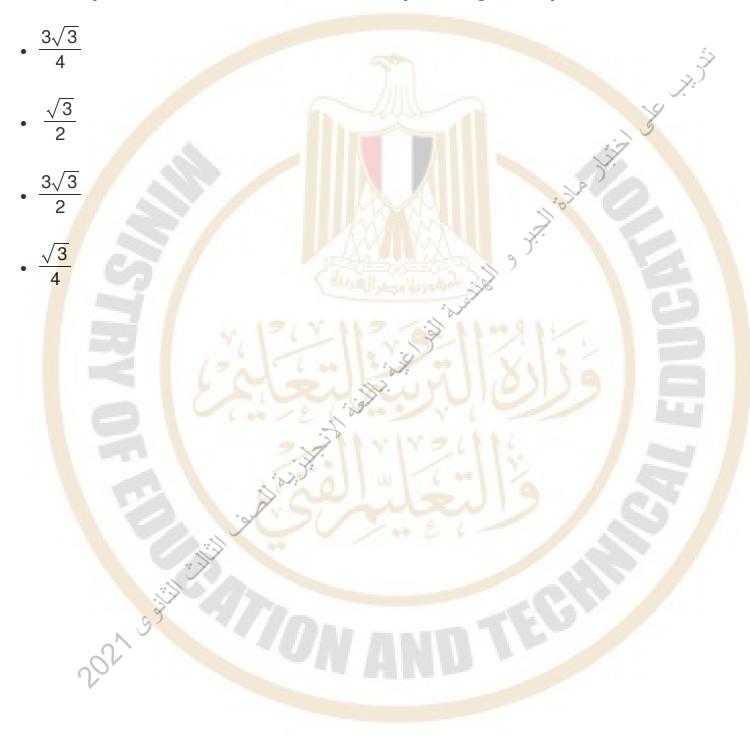
# Which of the following is the area of the triangle whose vertices are the points

which represent the cubic roots of unity on Argand's plane?



#### The number of ways can a person in a sport club participates in 3 games

at least from the set { football , hand ball , volley ball , basket ball } equals .......



In the expansion of  $\left(x^2 - \frac{1}{x}\right)^{15}$  according to the descending powers of x ,

the value of the term free of x equals ......



#### If the two planes:

18 x + 15 y - 6 z + 1 = 0, a x + b y + 2 z + 1 = 0 are parallel,

then  $a b = \dots$ 

- 30
- - 30
- 90
- - 90



If 
$$\mathbf{A} = \begin{pmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{pmatrix} then (A^2)^{-1} = \dots$$

$$\bullet \begin{pmatrix} \cos 2\theta & -\sin 2\theta \\ \sin 2\theta & \cos 2\theta \end{pmatrix}$$

$$\bullet \begin{pmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{pmatrix}$$

$$\bullet \begin{pmatrix}
-\cos\theta & -\sin\theta \\
-\sin\theta & -\cos\theta
\end{pmatrix}$$

$$\begin{pmatrix}
\cos 2 \theta & \sin 2 \theta \\
\sin 2 \theta & \cos 2 \theta
\end{pmatrix}$$

If the straight line  $\frac{x-2}{3} = \frac{y+1}{-4} = \frac{z+3}{5}$  makes with the planes x y, y z, z x angles of measures

L, M, N respectively, then  $\sin^2 L + \sin^2 M + \sin^2 N = \dots$ 

- 1
- 2
- √3
- $\frac{3}{2}$

If 1 ,  $\omega$  ,  $\omega^2$  are the cubic roots of unity , then  $\left(\frac{a}{\omega} - \frac{a}{\omega^2} + \frac{3a}{\omega^4} - \frac{3a}{\omega^5}\right)^2 = \dots$ 







In the expansion of  $\left(a x^2 - \frac{b}{x}\right)^{12}$  according to the descending powers of x.

### *T*<sub>7</sub> is ......

- The term containing  $x^6$
- The term free of x



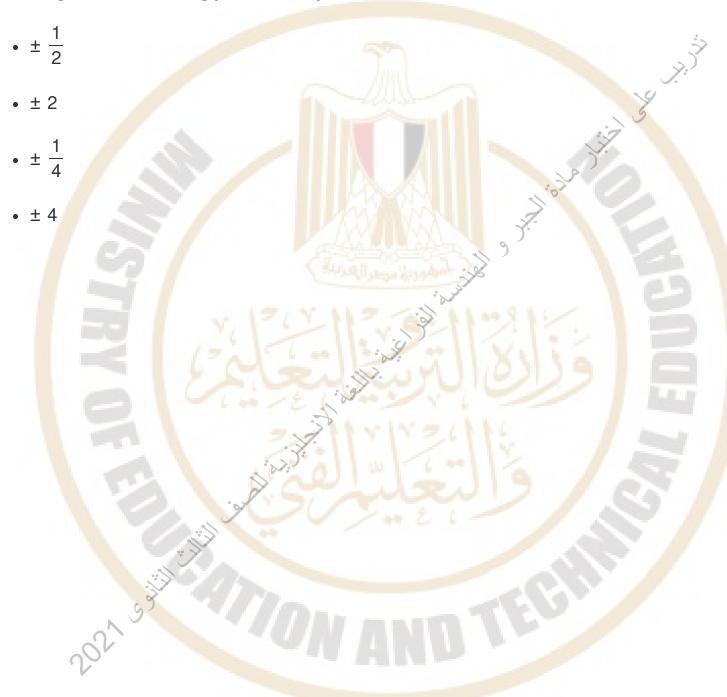
The code of a lock consists of 3 different digits number chosen from the digits { 1 , 2 , 3 , ..... , 9 } .

By how many ways we can form a code contains the digit 6?



If the coefficient of the ninth term in the expansion of  $\left(a\sqrt{x} - \frac{1}{a\sqrt{x}}\right)^{12}$ 

according to the desconding power of X equals 7920, then a = ........

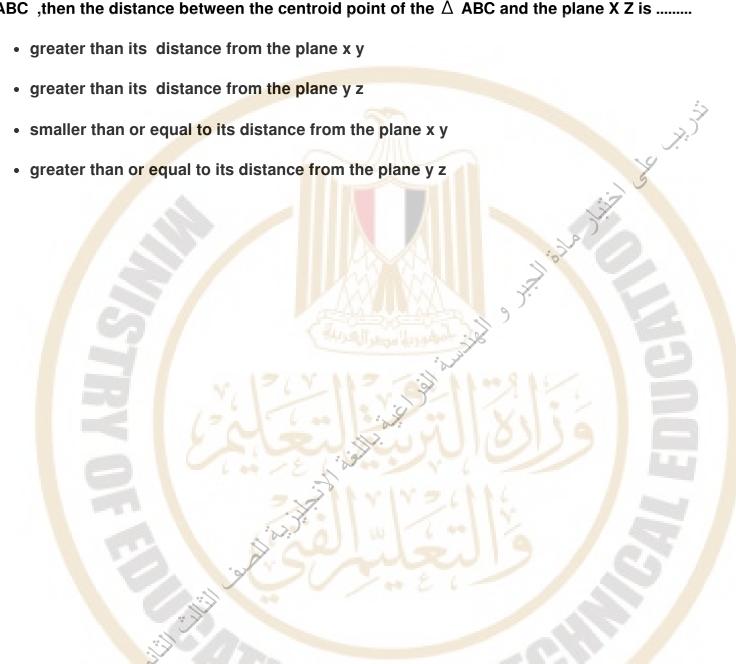


$$\begin{vmatrix} x & y & y \\ y & x & y \\ y & y & x \end{vmatrix} = (x + 2y) \times \dots$$

- $\begin{array}{c|ccccc}
   & 1 & y & y \\
  0 & x-y & 0 \\
  0 & 0 & x-y
  \end{array}$
- $\begin{array}{c|cccc}
  1 & y & y \\
  0 & x+y & 0 \\
  0 & 0 & x+y
  \end{array}$
- $\begin{vmatrix}
  1 & y & y \\
  0 & x-y & 2y \\
  0 & 0 & x+y
  \end{vmatrix}$

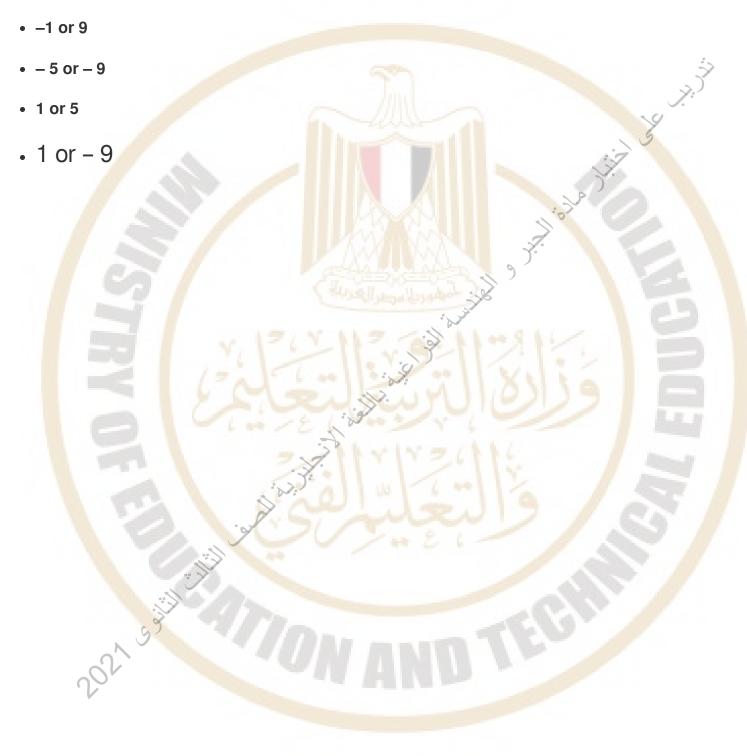
TON AND TEGS

If A (3, -4,0), B (15,0,2), C (0,-8,4) are three points in the space and they are the vertices of  $\triangle$  ABC ,then the distance between the centroid point of the  $\triangle$  ABC and the plane X Z is ........



#### The possible values of K which make the distance between the two points

A ( 2 , K , 3 ) , B ( -4 , 4 , 2 ) equals  $\sqrt{62}$  are ......



If the shortest distance between the point A ( 3, 5, 1 ) and the surface of the sphere whose centre M ( 1, 2, -5) is 2 length unit, then the radius of the sphere = ......length unit.



#### If the measure of the angle between the two planes :

 $\vec{r}$  . (3, -4, 2) = 7 and 3x + 4y - mz = 12 is 90°, then m = .......



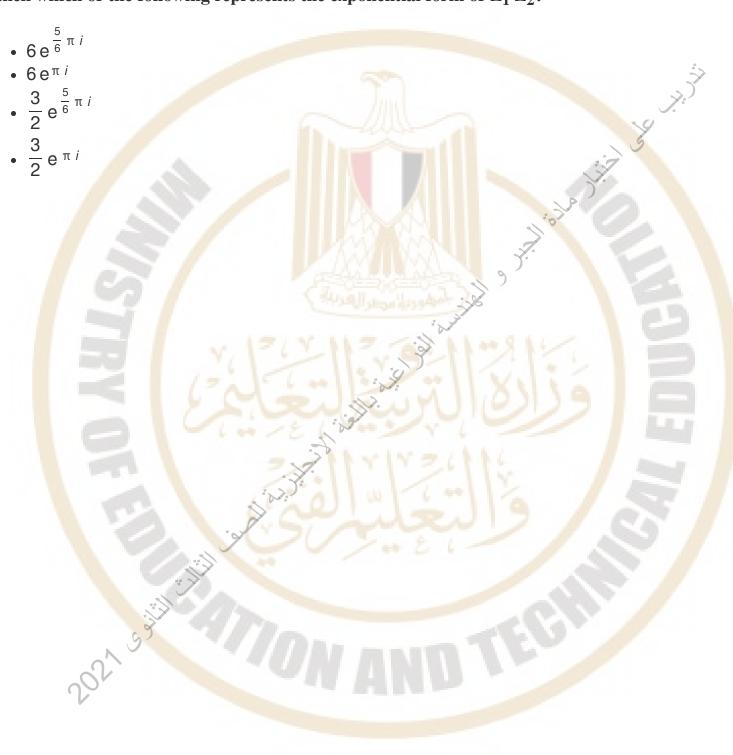
• 
$$\frac{-3}{2}$$

• 
$$\frac{-25}{2}$$

• 
$$\frac{3}{2}$$

If  $Z_1 = 3 (\cos 300^{\circ} + i \sin 300^{\circ})$ ,  $Z_2 = 2 (\sin 240^{\circ} + i \cos 240^{\circ})$ 

, then which of the following represents the exponential form of  $\mathbf{Z}_1\,\mathbf{Z}_2$ ?



If 
$$2^{n+1}C_r = {n+1 \choose r}$$
,  $\frac{{n \choose r+1}}{{n \choose r}} = \frac{5}{3}$ 

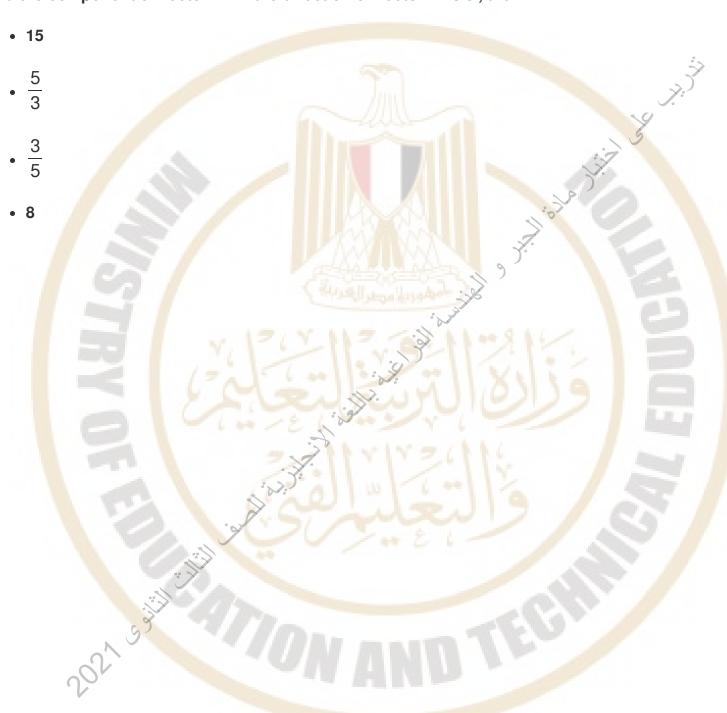
, then  ${}^nC_r + {}^nP_r = \dots$ 

- 63
- 33
- 60
- 36



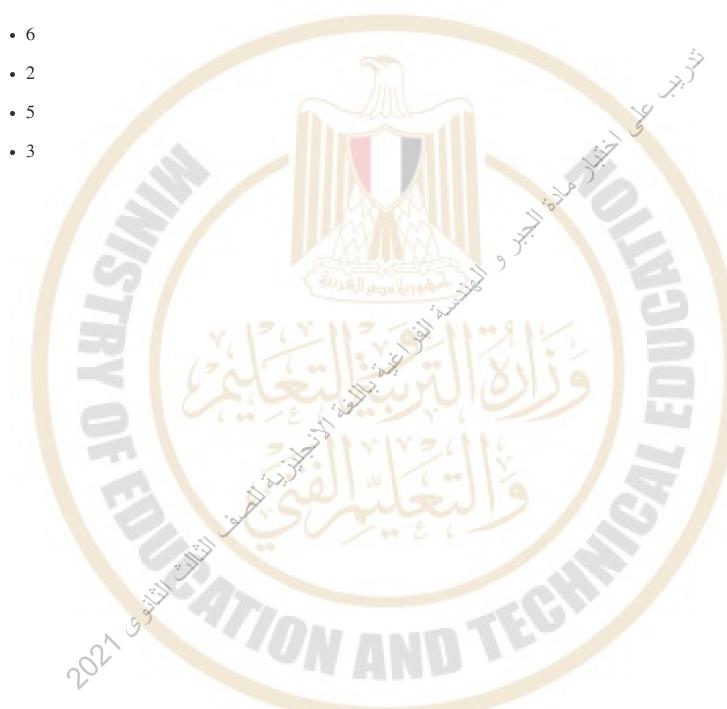
If  $\vec{A}$ ,  $\vec{B}$  are two vectors where  $\|\vec{A}\| = 5$ ,

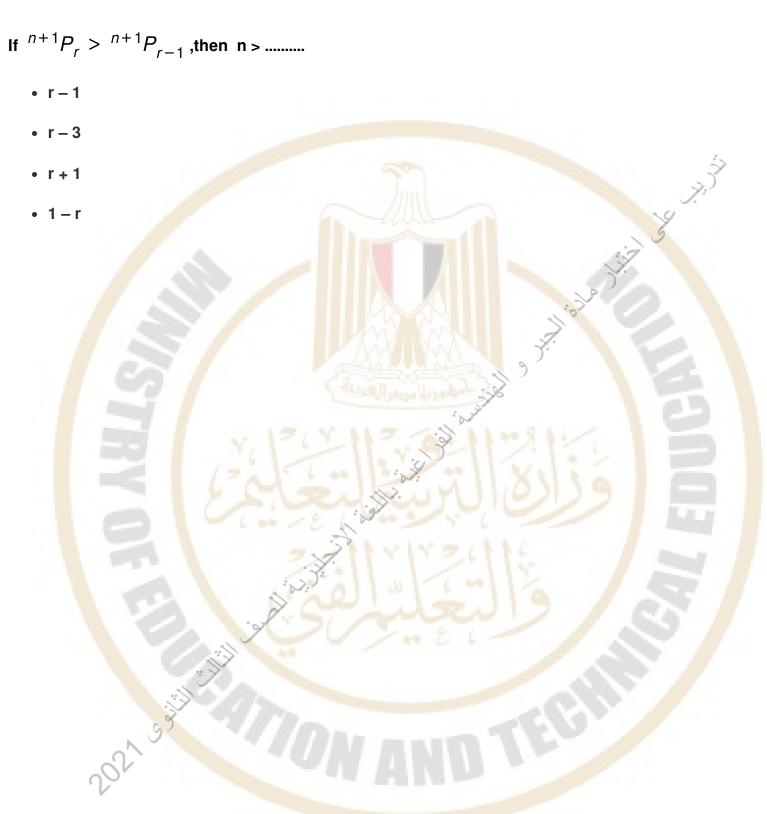
and the component of vector  $\vec{B}$  in the direction of vector  $\vec{A}$  is 3 , then  $\vec{A}$  .  $\vec{B}$  = ...........



If  $a e^{2\theta i} + b e^{-2\theta i} = 5 \cos 2\theta - i \sin 2\theta$  where a, b are two positive real numbers,

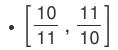
 $\theta \in \ ] \ 0 \ , \frac{\pi}{2} \ [$  ,  $i^2 = -1$  , then:  $a \ b = \dots$ 





If the greatest coefficient in the expansion of  $(a + x)^{20}$  is the coefficient of  $T_{11}$ ,

then a  $\in$  ...... where a  $\in$   $R^+$ 



- [10,11]
- $\bullet \left[ \frac{-11}{10} \, , \frac{10}{11} \right]$
- $\bullet \left[ \frac{9}{11}, \frac{10}{11} \right]$

### If $\mathbf{A}^{\star}$ is the augmented matrix for the linear system of equations

3 x + 2y - z = 4, x + y - z = 3, x = 2 z, then ......



• 
$$Rk(A^*) < 3$$

• 1 < 
$$Rk(A^*) \le 2$$

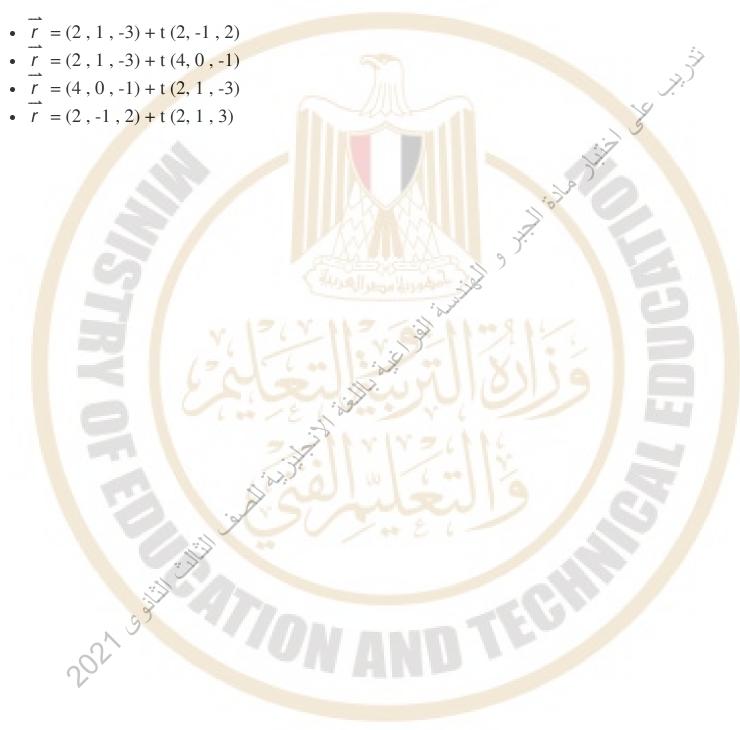
• 
$$1 \leq Rk(A^*) < 3$$

If  $\vec{A}$ ,  $\vec{B}$ ,  $\vec{C}$  represent three adjacent edges in a parallelepiped,  $\|\vec{A}\| = 2$ 

and the direction angles of vector  $\vec{A}$  are (135°, 60°, 120°),  $\vec{B} = (1, \sqrt{2}, 0), \vec{C} = (\sqrt{2}, 3, 5),$  then the volume of the parallelepiped = ...... cubic unit.

- 16
- 6√2
- 11
- $16\sqrt{2}$

If the plane 2x - y + 2z = 6 touches the surface of the sphere whose equation  $x^2 + y^2 + z^2 - 4x - 2y + 6z + 5 = 0$ , then the equation of the straight line which passing through the center of the sphere and the point of tangency is .......



If the plane bc x + ac y + ab z = abc intersects the coordinate axes x, y and z at the points K, N and M respectively and the plane bc x + ac y - ab z = - abc intersects the coordinate axes x, y and z at the points  $K^{\prime}$ ,  $N^{\prime}$  and M respectively, then the pyramid  $MKNK^{\prime}N^{\prime}$  is .......

