

Time:
2 hours

The experimental test for the third secondary stage in
(Algebra and solid Geometry)
In the academic year 2014 – 2015

(الاسئلة في صفتين)

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First: Answer one of the following two questions:

First question: Choose the correct answer from the given once:

- (1) $15 c_4 + 15 c_5 + 16 c_6 = \dots\dots\dots$
(a) $16 c_5$ (b) $16 c_6$ (c) $17 c_5$ (d) $17 c_6$
- (2) If ω is one of the roots of the equation $x^3 = 1$, then one of the roots of the equation $(x - 1)^3 = 1$ is $\dots\dots\dots$
(a) ω (b) $\omega - 1$ (c) $\omega + 1$ (d) 1
- (3) The two straight lines that not included in the same plane are $\dots\dots\dots$
(a) Parallel (b) Intersected (c) Skew (d) perpendicular
- (4) If the edge length of a regular triangular pyramid is 3 cm, then the height of the pyramid equals $\dots\dots\dots$ cm
(a) $\sqrt{2}$ (b) 3 (c) 6 (d) $\sqrt{6}$
- (5) If $ABCD A'B'C'D'$ is a cube, then the measure of the dihedral angle $(A-\overline{DD'}-B)$ equals $\dots\dots\dots$
(a) 90° (b) 30° (c) 45° (d) 60°
- (6) The number of planes passing through a straight line and a point not belong to this straight line is $\dots\dots\dots$
(a) One plane (b) Two planes (c) Three planes (d) Infinite number of planes

Second question: complete the following statements to be correct:

- 1) $\frac{7+4\omega}{7\omega^2+4} + \frac{5-3\omega^2}{5\omega-3} = \dots\dots\dots$
- 2) If $(n - 4) p_r \times (6 - n) c_r = 1$, then $\lfloor n-r \rfloor = \dots\dots\dots$
- 3) If a straight line is drawn inclined to a plane and perpendicular to the straight line lie in this plane, then the projection of the inclined straight line to the plane will be $\dots\dots\dots$
- 4) If the diagonal length of a cube equals 6 cm, then the length of its edge equals $\dots\dots$ cm
- 5) If a straight line is drawn perpendicular to two intersected straight lines from their point of intersection, then it will be $\dots\dots\dots$
- 6) The two planes included three non collinear points are $\dots\dots\dots$

باقي الاسئلة في الصفحة التالية

Second: Answer the following questions:**Third question:**

a) Without expanding the determinate ,Prove that :
$$\begin{vmatrix} bc & a^2 & a^2 \\ b^2 & ca & b^2 \\ c^2 & c^2 & ab \end{vmatrix} = \begin{vmatrix} ac & bc & ab \\ bc & ab & ac \\ ab & ac & bc \end{vmatrix}$$

b) If Z is a complex number where, $Z + 2 = i (Z - 2)$ find Z in the triangular form then determine the square roots of Z in the exponential form .

Fourth question:

a) Use crammer's method to find the solution set of the following system of equations

$$X + Y + Z = 3 \quad , \quad X - Y + Z = 1 \quad \text{and} \quad X + Y - 2Z = 0$$

b) In the expand of $(X^3 + \frac{5}{X})^n$ if the seventh term is free of X , find the value of n
Then, find the ratio between the sixth term and the middle term when $X = -2$

Fifth question:

a) \overline{BC} is a straight line lie in the same plane of the circle M and touch it at A where, $A \in \overline{BC}$, $\overline{MN} \perp$ the plane of the circle .

1- Prove that : The plane $NBC \perp$ The plane AMN

2- If the length of the radius of the circle equals 5cm , $MN = 5\sqrt{3}\text{cm}$,
find the measure of the angle $(N - \overline{BC} - M)$

b) $MABC$ is a triangular pyramid, a plane X intersects the edges \overline{MA} , \overline{MB} and \overline{MC} at D , E and F respectively, where: $\frac{MD}{DA} = \frac{ME}{EB} = \frac{MF}{FC} = \frac{1}{3}$.

1- Prove that : The plane $X \parallel$ the plane ABC .

2- If $N \in \overline{BC}$, \overline{MN} is drawn to intersect \overline{EF} at H .

Prove that: 1) $\overline{DH} \parallel \overline{AN}$

2) $AN = 4 DH$