ETHIOEDUCATION
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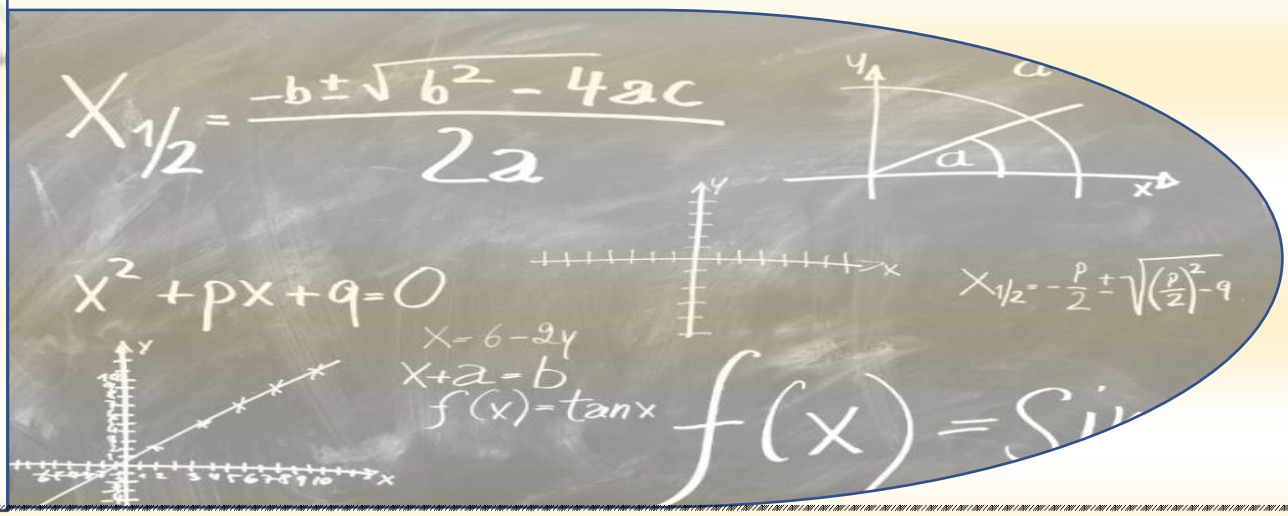
Dr. NEGA EDUCATION CENTER AND EDUCATION CONSULTANCY

ESSLCE 2013/14

(November)

Subject :Math

INTERACTIVE LESSON



1.If the volume of a right circular cone is 64π and the diameter of its base is 8 cm, what is the height of the cone?

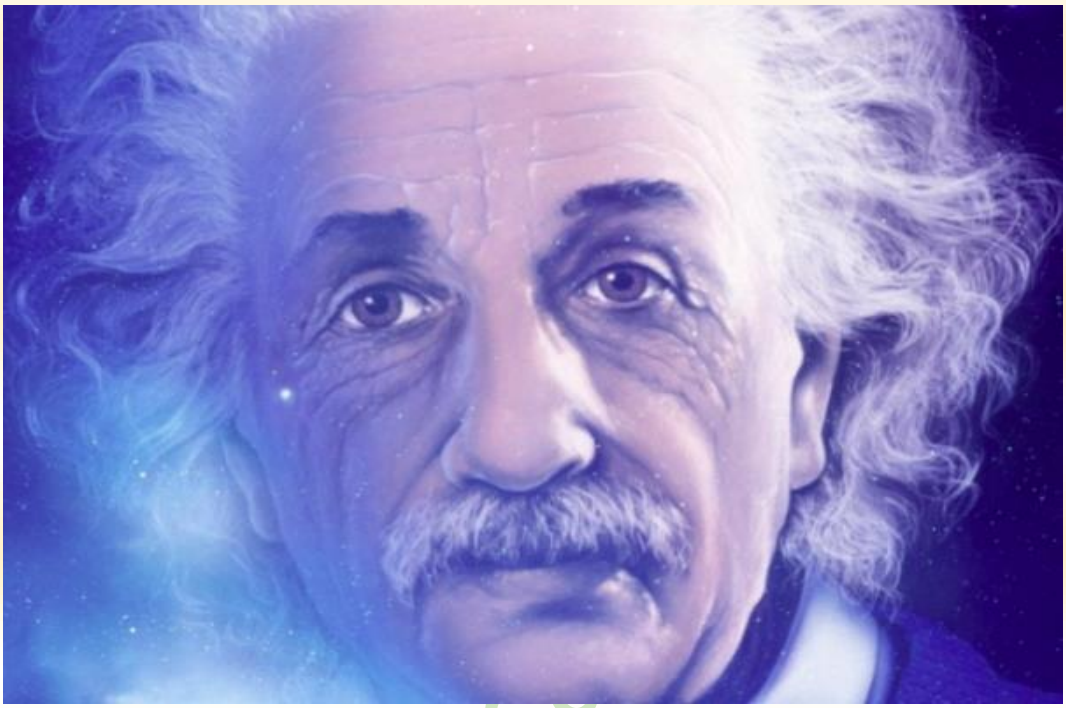
A.8cm

B. 3cm

C.4cm

D.12cm

The Answer is correct!!! Go to the next question



The Answer is Not correct, Try Again

2.What is the surface area of sphare with the radius of 6cm?

A. 48π cm^2

B. 144π cm^2

C. $24\ \pi$ cm^2

D. $36\ \pi$ cm^2

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

3. If $f(x)=x^2+px+1$ where f(0) and f(1) have opposite signs so that f has root in (0,1), then which value of the following number is a possible value of P

A.2

B.3

C.-3

D.-2

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

4. Let $R=\{(x,y)/y\geq x^2+1$, and $y\leq 5)\}$ be a relation. Then which of the following define the inverse of R?

A. $\{(x,y)/x\leq y^2+1, x\geq 5\}$

B. $\{(x,y)/x\geq y^2-1, x\leq 5\}$

C. $\{(x,y)/x\geq y^2+1, x\leq 5\}$

D. $\{(x,y)/x\geq y^2+1, x\geq 5\}$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

5.The radian measure of an angle of 120^0 is equal to:

A.$\pi/4$

B.$2\pi/3$

C.$\pi/8$

D.$\pi/2$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

6.Which of the following is the masure of an exterior angle of a 10 sides regular polygons?

A. 144^0

B. 72^0

C. 36^0

D. 180^0

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

7.What are the quotient and remainder respectively, when 75 is divided by 20?

A.4 and 5

B.3 and 15

C.2 and 19

D.15 and 3

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

8. Consider the points A(-2,1), B(3,0), C(3,-1) and D(1,1) in xy-plane. If U=$\overrightarrow{AB}$ and v=$\overrightarrow{CD}$, then which one of the following is equal to *u*-*v*

A.(3,1)

B.(-7,3)

C.(-3,1)

D.(7,-3)

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

9. What is the dot(scalar) product of the vector is u=i+2j and v=2i+4j?

A -8

B 5

C 6

D 7

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

10. Which one of the following is the derivatives of $f(x)=\tan x + 3^x$

A. $-\tan x + 3^x \ln x$

B. $\sec^2 x + 3^x$

C. $\sec^2 x + 3^X \ln x$

D. $-\csc^2 x + 3^x + 3^x \ln x$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

11. What is the image of the circle with equation $(x+2)^2+(y-2)^2=1$, when it is rotated though $\pi/6$ about the origin?

A. $(x+\sqrt{3}-1))^2+(y-(\sqrt{3}+1))^2=1$

B. $(x-(\sqrt{3}+1))^2+(y+\sqrt{3}-1))^2=1$

C. $(x+(\sqrt{3}+1))^2+(y-\sqrt{3}-1))^2=1$

D. $(x-(\sqrt{3}-1))^2+(y+\sqrt{3}+1))^2=1$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

12.The angle deprression of the top of a flag pole from the top of a building that is $40\sqrt{3}$m away from the falg pole 30^0. If the height if the flag pole is 10m,what is the height of the building?

A. $20\sqrt{3}$m

B.$10(4\sqrt{3}+1)$m

C.50m

D.40m

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

13. What is the locus all points in the plane in which the sum of the distance from two fixed points in constant?

A. Ellapse

B. Circle

C.Hyperbola

D.Parabola

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

14.In rolling a fire die, what is the probability of obtaining 3 or 5?

A.1/4

B.1/3

C.1/2

D.1/6

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

15.Given matrices $A=\begin{pmatrix} 2 & 0 & 5 \\ 3 & 1 & 4 \\ 0 & 6 & -2 \end{pmatrix}$ and $B=\begin{pmatrix} 1 & 3 & 0 \\ 6 & 5 & 2 \\ 9 & 7 & 0 \end{pmatrix}$.Which one of the following is A-B?

A. $\begin{pmatrix} 1 & -3 & -5 \\ -3 & -4 & 2 \\ 9 & 1 & 2 \end{pmatrix}$

C. $\begin{pmatrix} 1 & -3 & 5 \\ -3 & -4 & 2 \\ -9 & -1 & -2 \end{pmatrix}$

B. $\begin{pmatrix} 1 & 3 & 5 \\ -3 & -4 & 2 \\ 9 & 1 & 2 \end{pmatrix}$

D. $\begin{pmatrix} 1 & 3 & 5 \\ -3 & -4 & -2 \\ -9 & 1 & 2 \end{pmatrix}$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

16. Which one of the following quantities represents a vector?

A. Speed of a motorbike

B. Weight of an object

C. The width of your bedroom

D. Volume of a box

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

17. Which one of the following is an onto function from **R** on to $[0,\infty)$?

A. f(x)= $x^2 + 1$

B. f(x)= 2^x

C. f(x)= $\sqrt{x^2}$

D. f(x)= $|x|+2$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

18. A line segment chord in an ellipse which passes through the center and perpendicular to the major axis is called:

A. Eccentricity

B. Latus rectunm

C. Semi-major axis

D. Minor axis

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

19. Which one of the following is the simplified form of $\frac{4x^4-64}{2-x}$ for x ≠ 2?

A. 4(x-2)($x^2 - 4$)

B. 4(x+2)($x^2 + 4$)

C. -4(x-2)($x^2 + 4$)

D. -4(x+2)($x^2 + 4$)

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

20. What is the product of the two complex number z= 2-3*i* and w = 5+2*i*?

A. 16-11*i*

B. 29

C. 16 + 11*i*

D. 4-11*i*

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

21. The distance from the point P(3,4) to the line L with equation: $3x+4y-5=0$ is

A. 6 units

B. 5 units

C. 7 units

D. 4 units

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

22. Which one of the following gives the polar form of complex number z=2-2$\sqrt{3i}$?

A. $4\left(\cos\frac{3}{4}\pi + i\sin\frac{3}{4}\pi\right)$

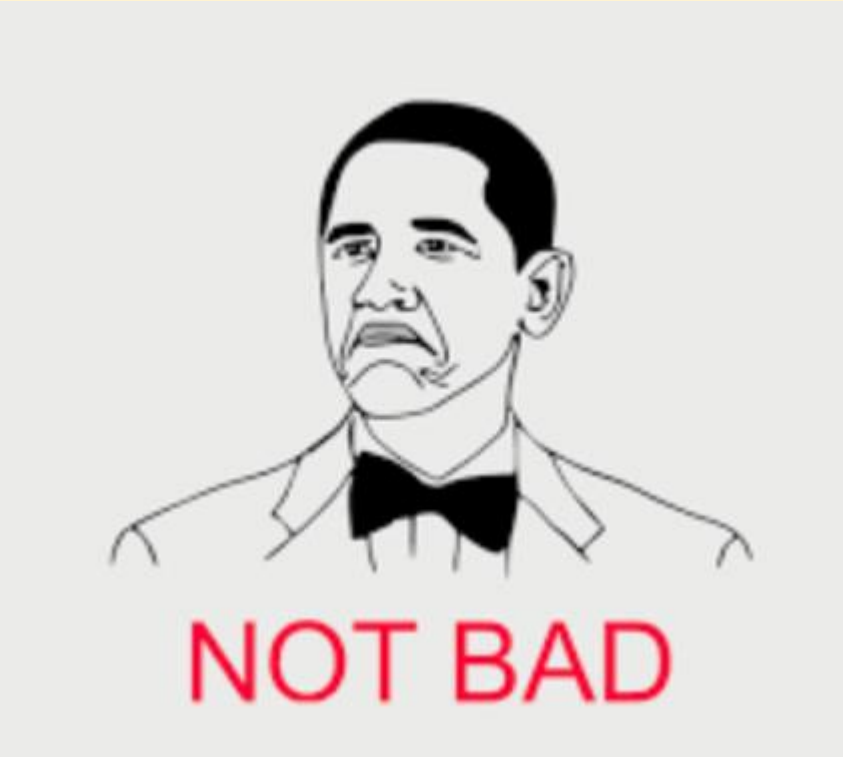
B. $4\left(\cos\frac{1}{3}\pi + i\sin\frac{1}{3}\pi\right)$

C. $4\left(\cos\frac{5}{3}\pi + i\sin\frac{5}{3}\pi\right)$

D. $4\left(\cos\frac{1}{4}\pi + i\sin\frac{1}{4}\pi\right)$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again



23. Which one of the following is true?

A. The range of arctangent function is$[-\pi, \pi]$.

B. The range of arcsine function is $(-\infty,\infty)$.

C The domain of arccosine function is [-1,1].

D. The domain od arcsine function is $[0, \pi]$.

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

24. The sum of the first 8 terms of a geometric sequence with first term 0.3 and common ratio $\frac{1}{10}$ is equal to:

A. $\frac{1}{3}\left(\frac{10^8-1}{10^8}\right)$

B. $\frac{3}{10}\left(\frac{10^8-1}{10^8}\right)$

C. $\frac{3}{10}\left(\frac{10^8-1}{10^9}\right)$

D. $\frac{1}{3}\left(\frac{10^8-1}{10^7}\right)$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

25.What is the seventh term of an arthmetic sequence whose thirs term is -4 and common difference is 5?

A. -15

B. 15

C. -16

D. 16

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

26. If $\lim_{x\to 2} f(x) = 6$ and $\lim_{x\to 2} g(x) = -9$ then $\lim_{x\to 2} \left(\frac{f-g}{2f-7}\right)(x) =$

A. -3

B. 3

C. -15

D. 15

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

27. What is the value of a for which the function defined by,

$$f(x)=\begin{cases} ax+3, & for\ x \geq 1 \\ x^2-2x+3, & for\ x < 1 \end{cases}$$ is continuous at 1?

A. -1

B. 1

C. 4

D. 3

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

28. Which of the following is true about bounded sequence?

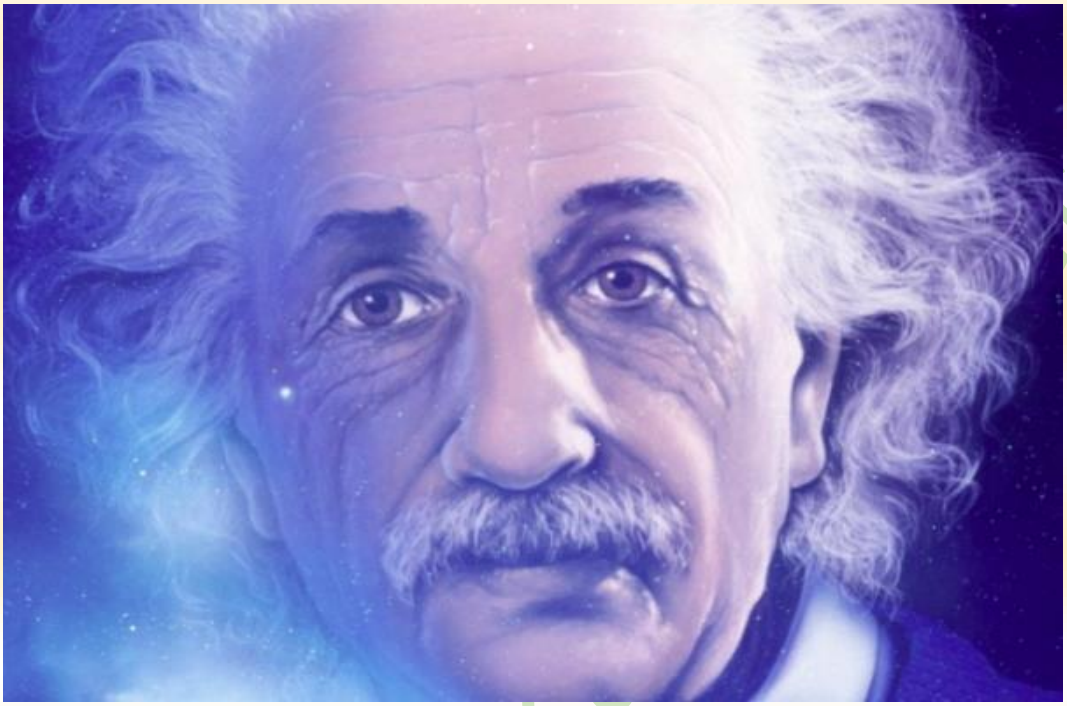
A Every increasing bounded sequence converges to the greatest lower bounded of the sequence.

B. Every bounded sequence is convergent.

C. Every monotone bounded sequence converges.

D. Every decreasing bounded sequence converges to the least upper bound of the sequence.

The Answer is correct!!! Go to the next question



The Answer is Not correct, Try Again

29.If f and g are continuous functions at a, then which of the following function may NOT be continuous at a?

A. fg

B. 2f+3g

C. f-2g

D. $\frac{f}{g}$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

30. Which one of the following sets is the symmetric difference, A Δ B, of the sets A={1,3,5,6,8,10} and B={2,5,8,11}?

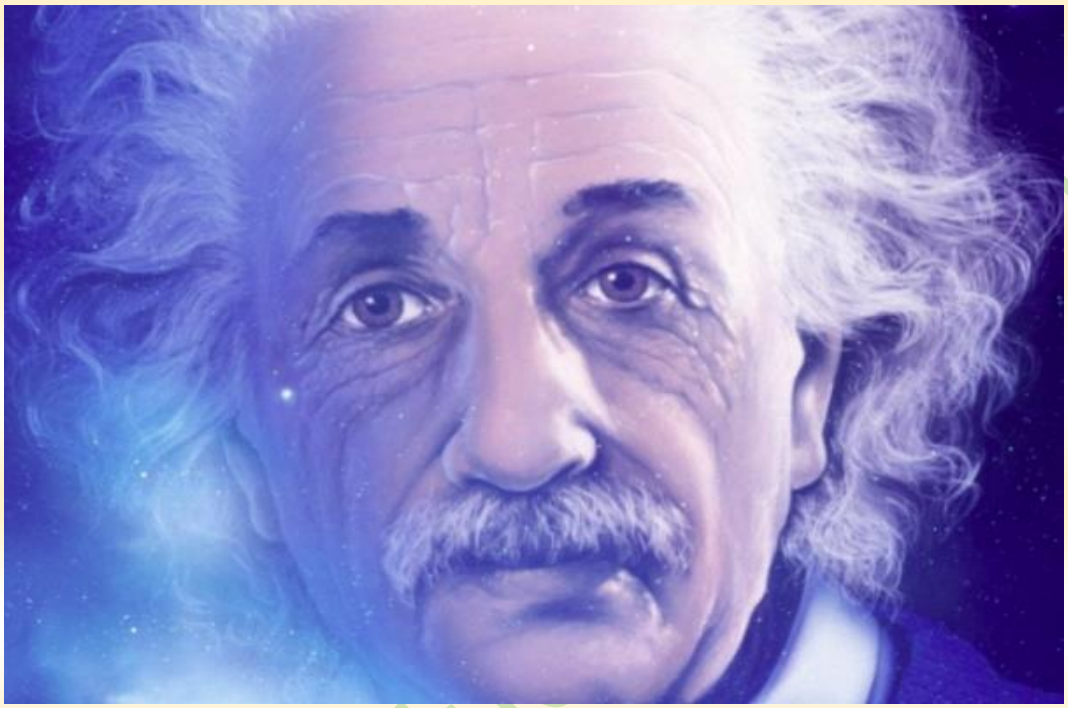
A. {1,2,3,6,10,11}

B.{1,3,6,10}

C.{1,2,3,5,6,8,10,11}

D. {2,11}

The Answer is correct!!! Go to the next question



The Answer is Not correct, Try Again

31. The simplified form of expression $\frac{6\sqrt{20}-3\sqrt{45}}{3\sqrt{75}}$ is:

A. $\frac{\sqrt{15}}{5}$

B. $\sqrt{5}$

C. 5

D. $\frac{1}{5}$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

32. Which of the following is true about arithmetic Mean of a given data?

A. There can be two means for a given data.

B. It is affected by extreme values.

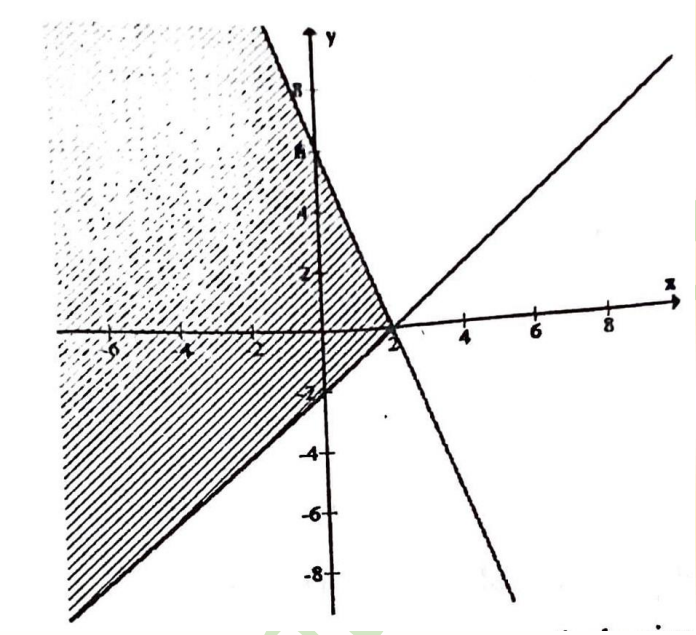
C. It can be obtained even in the absence of some of the values in the data.

D. It can also be used for qualitative data.

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

33. The graph of a certain relation **R** is represented by the shaded region shown on the figure below.



Which one of the following pairs of sets respectively gives the domain and range of this relation?

A. **R** and $\{y/y \leq 2\}$

B. **R** and **R**

C. $\{x/x \leq 2\}$ and $\{y/y \leq 6\}$

D. $\{x/x \leq 2\}$ and **R**

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

34. In Δ ABC, if AB = 10 units, BC = 14 units and AC =8 units, then the area of the triangle is

A. $16\sqrt{3}\ square\ unit.$

B. $16\sqrt{2}\ square\ unit.$

C. $10\sqrt{6}\ square\ unit.$

D. $16\sqrt{6}\ square\ unit.$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

35. Which one of the following is the augmented matrix associated to the system os equations $\begin{cases} 2x + y + 3Z + 4 \\ X - Z = 1 \\ -4X + Y - 3 \end{cases}$

A. $\left(\begin{array}{ccc|c} 1 & 2 & 3 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & -4 & -1 & 3 \end{array}\right)$

B. $\left(\begin{array}{ccc|c} 2 & 1 & 3 & 4 \\ 1 & 0 & -1 & 1 \\ -4 & 1 & 0 & 3 \end{array}\right)$

C. $\left(\begin{array}{ccc|c} 3 & 2 & 1 & 1 \\ 1 & 1 & 1 & 3 \\ -1 & -4 & 1 & 4 \end{array}\right)$

D. $\left(\begin{array}{ccc|c} 3 & 1 & 2 & 4 \\ -1 & 0 & 1 & 1 \\ -4 & 1 & -3 & 0 \end{array}\right)$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

36. If A is a 3*3 matrix with det(A)= 5. Then what is the det of $2A^{-1}$

A. $\frac{2}{5}$

B. 10

C. 30

D. 40

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

37. Suppose f is a continuous function on an interval [a,b] and differentiable on (a,b) with the property f(a) = f(b). Which one of the following must be true?

A. The function has maximum value in (a,b)

B. The graph of f has horizontal tangent line at (c, f(c)) for some c ∈ (a,b).

C. The function has a zero in(a,b).

D. The function has minimum values in (a,b)

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

38. Let f be a continous function on **R** and *c* be a number in a domain of f. which one of the following must be true about the function?

A.If $f^{n}(c)=0$, then (c,f*(c)*) is an inflection point of f.

B.If *c* is a critical number of f, then f(c) is a local extremvalue of f

C. An absolute maximum value of f which is attained at a critical number is also a local maximum value of f.

D. If f(*c*) is a local maximum value of f, then f`(*c*)=0

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

39. Let f be a continous function on **R** and *c* be a nember in the domain of f. which one of th following must be true about the function?

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B. If *c* is a critical number of f, then f(*c*) is alocal extereme value of f

C.An absolute maximum value of f which is attained at a critical number is also a local maximum value of f.

D. If f(*c*) is a local minimum value of f,then $f`(c)=0$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

40. Which one of the following intervals is the solution set of the inequality $x^2-5x+6\leq 0$?

A.[2,3]

B.[0,2]

C.[$-\infty$,2]

D.[3,∞]

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

41. Which of the following compound statements has a converse with truth value of false?

A. If athelet Derartu Tulu was born on october 21,1971,then 6 is prime

B. If man is mortal, then the earth does not rotate around dthe sun

C.If 6 is prime integer, then 4 is not even number

D. If man is immortal, then the earth does not routate around the sun

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

42. Which of the following is ture about the trigonometric values of the given pairs of angle?

A. $\cos(120^0)=\cos(60^0)$

B. $\sin(120^0)=\sin(60^0)$

C. $\tan(75^0)=\tan(105^0)$

D. $\sin(75^0)=\cos(105^0)$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

43. What are the coordinates of a point that divides the line segment with end points P(0,1) and Q(5,6) in the ratio 2:3 from P?

A.(3,2)

B.(0,3)

C.(2,3)

D.(0,2)

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

44. The solution set of the equation given by $\log(x^2-3)=2\log(x-1)$ is :

A.{2}

B.{1/2}

C.∅

D.{4}

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

45.Which of the following trigometric values is correct?

A.$\cos(-120^0)=-0.5$

B.$\sin(-120^0)=0.5$

C. $\cos(-60^0)=\sqrt{3}/2$

D.$\tan(-120^0)=-1$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

46. Which of the following pairs of events are dependent?

A.Drawing to balls successively from a box containing balls having the same size and shape with replacement

B.Any event obtaining from tossing a coin and rolling a die at the same time

C.Tossing two coins simltaniusly and obtaining head from one tail from the other

D.Drawing two cards one after the other from a well shufeld pack of carss without replacement.

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

47. Which of the following is variance of the data given as 2,3,4,5,7.

A.2.96

B.2.46

C.3.70

D.3.06

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

48.In order to find point P in space one can start from the origin O(0,0,0); moves 5 unit in the direction of negative x-axis, hten move 5 units in the direction of posetive y-axis and finally moves 5 unit in the direction of negative z-axis. Which one of the following is orederd triple of numbers represented by point P?

A.(5,5,5)

B.(-5,-5,-5)

C.(5,-5,5)

D.(-5,-5,5)

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

49. What is the value of $\int_0^1 xe^x\,dx$

A.1

B.-1

C.-e

D.e

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

50. Let f be a continous function on [a,b].Then which of the following is NOT true

A. $\int_a^b kf(x)dx = k\int_b^a f(x)dx$ for any constant k.

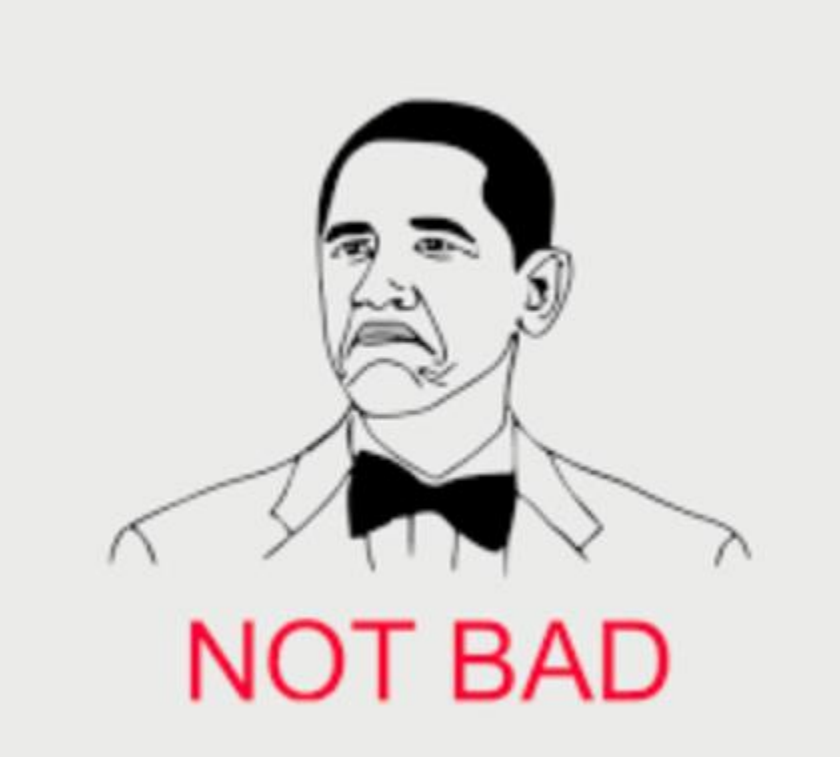
B. $\int_d^c f(x)dx = \int_c^a f(x)dx$

C. $\int_c^c f(x) = 0$ for any c in (a,b)

D. $\int_a^b f(x)dx = \int_a^c f(x)dx - \int_c^b f(x)dx$ for any c in (a,b)

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again



51. $\int(\frac{1}{\sqrt{x}} - e^{-3x} + \frac{5}{x2})$dx is equal to:

A. $2\sqrt{x}+e^{-3x}_{/3}$-5/x+c

B. $2\sqrt{x}+e^{-3x}_{/3}$+5/x+c

C. $2\sqrt{x}$-$e^{-3x}_{/3}$+5/x+c

D. $2\sqrt{x}$-$e^{-3x}_{/3}$-5/x+c

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

52. Suppose f is a twice continously differentialble function and $f^n(3)=5$. g(x)=f(2x+3), then the second derivative of g at 0 is equal to:

A.5

B.10

C.40

D.20

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

53. Let f and g be two functions. Which one of the following satatment is true about f or g

A. If $f'(a)=0$, then the tangent to the graph of f at $(a,f(a))$ is $y=a$

B. If f and g diffrerentiable at a, then f/g is differentiable at a

C. The line y=0 is the tangent line to the graph f(x)=|x| at(0,0)

D. If f differentiable at a, then it is continuous at a

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

54. What is the derivative of the function f(x)=$\frac{xe^x}{cosx}$at x =0?

A.1

B.0

C.2

D.-1

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

55. If r_1 and r_2 the oots of the equation $3x^2+9x+16=0$, which one of the following is true?

A. $r_1.r_2=-16/3$

B. $r_1+r_2=3$

C. $1/r_1+1/r_2=9/16$

D. $r_1^2+r_2^2=-5/3$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

56. The following is the distribution of the marks of students obtained in Mathematics test out of 50

Range of marks	20-25	26-31	32-37	38-43	44-49
Frequency	15	30	25	20	10

What is the first quartlie of the distribution?

A.26.5

B.27.5

C.28

D.26

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

57. $\int x^3+x^2-x/x^2+x-2\ dx$ is equal to:

A. $x^2/2-1/3\ln|x-1|+2/3\ln|x+2|+c$

B. $x^2/2+1/3\ln|x-1|-2/3\ln|x+2|+c$

C. $x^2/2+1/3\ln|x-1|+2/3\ln|x+2|+c$

D. $x^2/2-1/3\ln|x-1|-2/3\ln|x+2|+c$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

58. Let p and q be propositions. Which of the following compound statement is a tautology?

A. $(p \Rightarrow q) \Leftrightarrow p$

B. $(pVq) \Leftrightarrow p$

C. $(p \Rightarrow q) \Leftrightarrow (\neg pvq)$

D. $(p \wedge q) \Leftrightarrow p$

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

59.If Birr 20,000 is deposeted in a bank at a rate of 12% interest compounded monthly, how long will it take to double the amount?

A.5.81 years

B.5 years

C.7.59 years

D.6 years

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

60. What is the point of intersection of the medians of ΔABC whose vetices are given by A(0,0), B(6,0) and C(0,4)?

A.(1,2/3)

B.(2,4/3)

C.(6/5,4/5)

D.(9/5,6/5)

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

61.Which one of the following points is, inside the sphere with equation $x^2 + y^2 + z^2 = 5$

A. (1,-2,2)

B. (1,1,1)

C. (1,2,3)

D. (0,-2,3)

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

62. Which os the following is NOT true about argument and validity?

A. An argument which is not valid is fallacy.

B. The validity of an argument can be checked by using a truth table.

C. In valid argument, the conclusion may be true or false whenever all the premises as true.

D. In a valid argument if all the premises are true then the conclusion must also be true.

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

63. Which of the following is NOT true about the graph of

f(x)= $5 + \frac{|x|}{x+1}$?

A. y=4 is its horizontal asymptote.

B. x = -1 is its vertical asymptote of f.

C. y = 5+x is its oblique asymptote.

D. y = 6 is its horizontal asymptote of f.

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again

64. Which one of the following is true about matrix $\begin{pmatrix} 1 & 3 & 5 \\ 6 & 4 & 2 \\ 9 & 7 & 0 \end{pmatrix}$?

A. The cofactor of the entry 5 is -6.

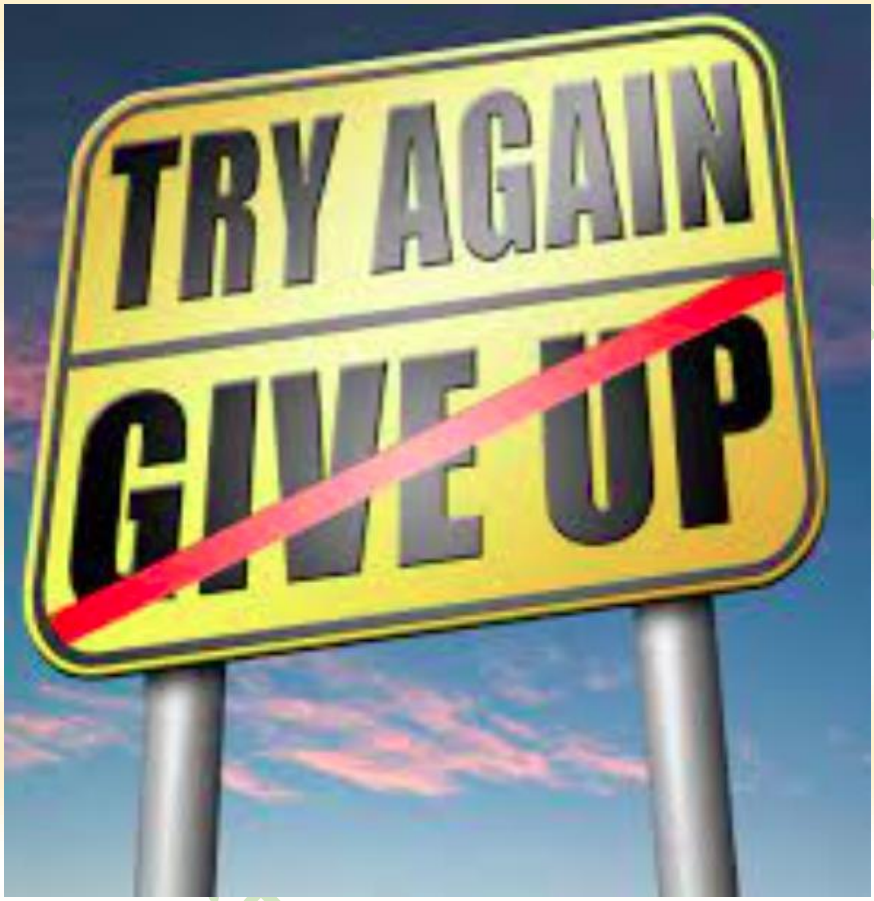
B. The minor of the entry 3 is 18.

C. The cofactor of the entry 1 is -14.

D. The minor of the entry 0 is 14.

The Answer is correct!!! Go to the next question

The Answer is Not correct, Try Again



65. If $\vec{a} = (4,3,2)$ and $\vec{a} = (1,2,-3)$ are two vectors in space, then which one of the following is NOT correct?

A. $\vec{a} + \vec{b} = (5,5,-1)$

B. $\vec{a} + 2\vec{b} = (6,7,-4)$

C. $\vec{b} - \vec{a} = (-3,-1,-5)$

D. $\vec{a}$-$2\vec{b} = (2,1,8)$

The Answer is correct!!!

CONGRAGULATION!

The Answer is Not correct, Try Again