MATHS

BOOKS - INDEPENDENTLY PUBLISHED MATHS (ENGLISH)

DIAGNOSTIC TEST

Mcqs Exercise

1. A linear function, f, has a slope of -2, f(1)=2 and f(2)=q. find q.

A. 0

B. $\frac{3}{2}$

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

D. 3

Answer: A

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2. A function is said to be even if f(x)=f(-x). Which of the following is not an even function?

A. y=|x|

B. y=secx

C. $y=\log x^2$

D. $y = x^2 + \sin x$

Answer: D

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3. What is the radius of a sphere, with centre at the origin, that passes through point (2,3,4)?

A. 3

B. 3.31

C. 3.32

D. 5.3

Answer: D

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4. If $f(x) = \frac{5x + 2}{-3x + 1}$, what value does f(x) approach as x gets arbitrarily large?

A. -15

B. $-\frac{5}{3}$

C. -1

D. $\frac{3}{5}$

Answer: B

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5. If $f(x) = x^2 - ax$, then f(a)=

A. a

B. $a^2 - a$

C. 0

D. 1

Answer: C

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6. The average of your first three test grades is 78. what grade must you get on your fourth and final test to make your average 80?

A. 80

B. 82

C. 84

D. 86

Answer: D

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7. $\log_7 9 =$

A. 0.89

B. 0.95

C. 1.13

D. 1.21

Answer: C

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8. Which of the following is perpendicular to the line $y = -3x + 7$?

A. $y = \frac{1}{-3x + 7}$

B. $y = 7x - 3$

C. $y = \frac{1}{3}x + 5$

D. $y = -\frac{1}{3}x + 7$

Answer: C

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9. How many integers are there in the solution set of $|x - 2| \leq 5$?

A. 0

B. 7

C. 9

D. 11

Answer: D

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10. If $f(x) = \sqrt{x^2}$, then f(x) can also be expressed as

A. x

B. $-x$

C. $\pm x$

D. $|x|$

Answer: D

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11. If $x+1$ is a factor of x^3-5x^2+kx+2, then k=

A. -4

B. -2

C. 0

D. 2

Answer: A

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12. George invests $1,000 into an account that he hopes will earh 12% interest annually. How many years (rounded to the nearest year) will it take his investment to double in value?

A. 4

B. 6

C. 7

D. 8

Answer: B

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13. A linear function has an x-intercept of $\sqrt{3}$ and a y-intercept of $\sqrt{5}$. The graph of the function has a slope of

A. -1.29

B. -0.77

C. 1.29

D. 2.24

Answer: A

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14. If f(x)=2x-1, find the value of x that makes f(f(x))=9.

A. 2

B. 3

C. 4

D. 5

Answer: B

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15. The plane $2x+3y-4z=5$ intersects the x-axis at $(a,0,0)$, the y-axis at $(0,b,0)$, and the z-axis at $(0,0,c)$. The value of $a+b+c$ is

A. 1

B. $\frac{35}{12}$

C. 5

D. $\frac{65}{12}$

Answer: B

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16. Given the set of data 1,1,2,2,2,3,3,4, which one of the following statements is true?

A. mean $\leq$ median $\leq$ mode

B. median $\leq$ mean $\leq$ mode

C. median $\leq$ mode $\leq$ mean

D. mode $\leq$ mean $\leq$ median

Answer: C

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17. If $\frac{x-3y}{x}=7$, what is the value of $\frac{x}{y}$?

A. $-\frac{8}{3}$

B. -2

C. $-\frac{1}{2}$

D. $\frac{3}{8}$

Answer: C

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18. Find all values of x that make $\begin{vmatrix} 2 & -1 & 4 \\ 3 & 0 & 5 \\ 4 & 1 & 6 \end{vmatrix} = \begin{vmatrix} x & 4 \\ 5 & x \end{vmatrix}$

A. 0

B. ± 1.43

C. ± 3

D. ± 4.47

Answer: D

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19. Suppose $f(x) = \frac{1}{2}x^2 - 8$ for $-4 \leq x \leq 4$. Then the maximum value of the graph of $|f(x)|$ is

A. -8

B. 0

C. 2

D. 8

Answer: D

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20. If $\tan\theta = \frac{2}{3}$, then $\sin\theta$=

A. ± 0.55

B. ± 0.4

C. 0.55

D. 0.83

Answer: A

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21. Suppose the graph of $f(x) = -x^3$ is translated 4 units right and 2 units down, resulting in the graph of a new function g. what is the value of g(-2)?

A. -218

B. -10

C. 6

D. 214

Answer: D

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22. i^{2014}=

A. i^{13}

B. i^{203}

C. i^{726}

D. i^{1993}

Answer: C

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23. The statistics below provide a summary of IQ scores of 100 children.

Mean:100

Median:102

Standard Deviation:10

First Quartile:84

Third Quartile:110

About 50 of the children in this sample have IQ scores that are

A. less than 84

B. less than 110

C. between 84 and 110

D. between 64 and 130

Answer: C

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24. If f(x)=secx, then

A. $f(x) = f(-x)$

B. $f\left(\frac{1}{x}\right) = -f(x)$

C. $f(-x) = -f(x)$

D. $f(x) = f\left(\frac{1}{x}\right)$

Answer: A

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25. The polar coordinates of a point P are $(2, 200^\circ)$ The rectangular coordinates of P are

A. $(-1, -\sqrt{3})$

B. $(-1, \sqrt{3})$

C. $(-\sqrt{3}, -1)$

D. $(-\sqrt{3}, 1)$

Answer: A

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26. The height of a cone is equal to the radius of its base. The radius of a sphere is equal to the radius of the base of the cone. The ratio of the volume of the cone to the volume of the sphere is

A. $\frac{1}{12}$

B. $\frac{1}{4}$

C. $\frac{1}{3}$

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

Answer: B

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27. In how many distinguishable ways can the seven letters in the word MINIMUM be arranged, if all the letters are used each time?

A. 7

B. 42

C. 420

D. 840

Answer: C

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28. Which of the following lins are asymptotes of the graph of $y = \frac{x}{x+1}$?

I. x=1

II. $x = -1$

III. $y = 1$

A. I only

B. II only

C. III only

D. II and III

Answer: D

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29. What is the probability of getting at least three heads when flipping four coins?

A. $\frac{3}{16}$

B. $\frac{1}{4}$

C. $\frac{5}{16}$

D. $\frac{7}{16}$

Answer: C

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30. How many four-digit personal identification nhumbers are possible if no digit can be used twice and no number can begin with 0?

A. 210

B. 4536

C. 6561

D. 10000

Answer: B

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31. 

In the figure above, S is the set of all points in the shaded region. Which of the following represents the set consisting of al points (2x,y), where (x,y) is a point in S?

A. 

B. 

C. 

D. 

Answer: C

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32. 

If a square prism is inscribed in a right circular cylinder of radius 3 and height 6 as shown

above, the volume inside the cylinder but outside the prism is

A. 2.14

B. 3.14

C. 61.6

D. 115.6

Answer: C

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33. What is the length of the major axis of the ellipse whose equation is $10x^2 + 20y^2 = 200$?

A. 3.16

B. 4.47

C. 6.32

D. 8.94

Answer: D

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34. The fifth term of an arithmetic sequence is 26, and the eighth term is 41. what is the first term?

A. 3

B. 4

C. 5

D. 6

Answer: D

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35. 

What is the measure of one of the larger angles of the parallelogram above that has vertices at (-2,-2), (0,1),(5,1), and (3,-2)?

A. 117.2°

B. 123.7°

C. 124.9°

D. 125.3°

Answer: B

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36. If $\cos x = -0.25$, then $\cos(\pi - x)$=

A. -0.25

B. -0.75

C. 0

D. 0.25

Answer: D

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37. The parametric equation of a line are x=3-t and y=1+t. the slope of this line is

A. -3

B. -1

C. $-\frac{1}{3}$

D. 1

Answer: B

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38. If $f(x) = 2x^2 - 4$ and $g(x) = 2^x$, the value of $g(f(1))$ is

A. -4

B. 0

C. $\frac{1}{4}$

D. 1

Answer: C

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39. If $f(x) = 3\sqrt{5x}$, what is the value of $f^{-1}(15)$?

A. 0.65

B. 0.9

C. 5

D. 7.5

Answer: C

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40. If $2\sin^2 x - 3 = 3\cos x$ and $90^\circ < x < 270^\circ$, the number of values that satisfy the equation is

A. 0

B. 1

C. 2

D. 3

Answer: D

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41. Thirty percent of the 20 people in the math club have blonde hair. If 3 people are selecfted at random from the club what is the probability that none has blonde hair?

A. 0.1

B. 0.25

C. 0.32

D. 0.4

Answer: C

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42. 

A. Which of the following could be the equation of one cycle of the graph in the figure above?

I. $y = \sin 4x$

II. $y = \cos\left(4x - \frac{\pi}{2}\right)$

III. $y = -\sin(4x + \pi)$

B. only I

C. only I and II

D. I,II and III

Answer: D

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43. Observers at locations due north and due south of a rocket launchpad sight a rocket at a height of 10 kilometers. Assume that the curvature of earth is negligible and that the rocket's trajectory at that time is perpendicular to the gound. How far apart are the two observers if their angles of elevation to the rocket are $80.5^\circ \text{ and } 68.0^\circ$?

A. 0.85 km

B. 4.27 km

C. 5.71 km

D. 20.92 km

Answer: C

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44. The vertex angle of an isosceles triangle is 35°. The length of the base is 10 centimeters. How many centimeters are in the perimeter?

A. 16.6

B. 17.4

C. 20.2

D. 43.3

Answer: D

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45. 

If the graph below represents the function $y = f(x)$, which of the following could represent the equation of the inverse of f?

A. $x = y^2 - 8y - 1$

B. $x = y^2 + 11$

C. $x = (y - 4)^2 - 3$

D. $x = (y - 4)^2 - 3$

Answer: C

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46. If kgt4 is a constant, how would you translate the graph of $y = x^2$ to get the graph of $y = x^2 + 4x + k$?

A. left 2 units and up k units

B. right 2 units and up (k-4) units

C. left 2 units and up (k-4) units

D. right 2 units and down (k-4) units

Answer: C

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47. If $f(x) = \log_6 x$ and $f(2) = 0.231$, the value of b is

A. 0.3

B. 1.3

C. 13.2

D. 20.1

Answer: D

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48. If $a_{n+1} = a_{n-1} + 2a_n$ for $n = 2, 3, 4, \ldots$ and $a_1 = 1$ and $a_2 = 1$, then a_5=

A. 7

B. 11

C. 17

D. 21

Answer: C

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49. Suppose $\cos\theta = u$ in $0 < \theta < \frac{\pi}{2}$. Then $\tan\theta =$

A. 1

B. $\frac{1}{\sqrt{1-u^2}}$

C. $\frac{u}{\sqrt{1-u^2}}$

D. $\frac{\sqrt{1-u^2}}{u}$

Answer: D

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50. A certain component of an electronic device has a probability of 0.1 of failing. If

there are 6 such components in a circuit, what is the probability that at least one fails?

A. 0.6

B. 0.47

C. 0.167

D. 6.0E-6

Answer: B

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