MATHS

BOOKS - INDEPENDENTLY PUBLISHED MATHS (ENGLISH)

MODEL TEST 3

Mcq

1. The slope of a line that is perpendicular to $2x+2y=7$

A. -2

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

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

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

Answer: C

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2. What is the remainder when $3x^4 - 2x^3 - 20x^2 - 12$ is divided by x+2?

A. -60

B. -36

C. -28

D. -6

Answer: C

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3. If $1 - \frac{1}{x} = 2 - \frac{2}{x}$, then $3 - \frac{3}{x} =$

A. -3

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

C. 0

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

Answer: C

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4. If f(x)=2 In x+3 and g(x)=e^x, then f(g)(3))=

A. 9

B. 11

C. 43.13

D. 47.13

Answer: A

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5. The domain of f(x)=$\log_{10}$ (sin x) contains which of the following intervals?

A. $0 \leq x \leq \pi$

B. $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$

C. $0 < x < \pi$

D. $-\frac{\pi}{2} < x < \frac{\pi}{2}$

Answer: C

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6. Which of the following is the ratio of the surface area of the sphere with radius r to its volume?

A. $\frac{4}{\pi}$

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

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

D. $\frac{r}{\pi}$

Answer: B

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7. If the two solutions of $x^2 - 9x + c = 0$ are complex conjugates, which of the following describes all possible value of c?

A. c=0

B. $c \neq 0$

C. clt9

D. $c > \frac{81}{4}$

Answer: D

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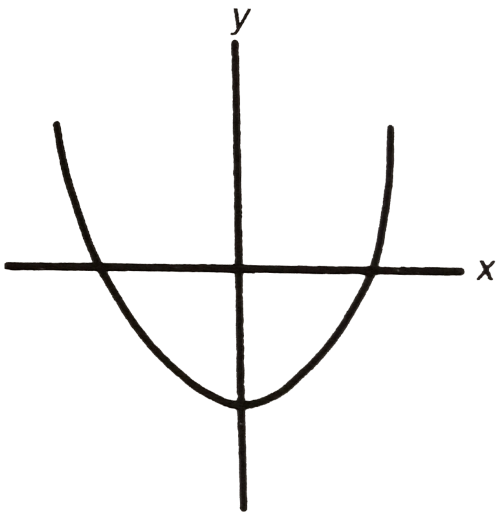
8. If tan x=3 , the numerical value of sqrt("csc x") is



A. 0.32

B. 0.97

C. 1.03

D. 1.78

Answer: C

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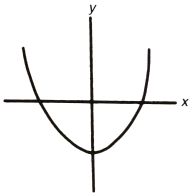
9.



In the figure above, the graph of y=f(x) has two transformations performed on it. First it is rotated 180° about the origin, and then it is reflected about the x-axis. Which of the following is the equations of the resulting curve?

A. y=-f(x)

B. y=f(x+2)

C. x=f(y)

D. y=f(x)

Answer: D

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10. If $f(x)=\frac{3x^3-7x^2+2}{4x^2-3x-1}$ what does f(x) approach as x gets infinitely larger?

A. 0

B. $\frac{3}{4}$

C. 1

D. ∞

Answer: D

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11. The set of points (x,y,z) such that x=5 is

A. a point

B. a line

C. a plane

D. a circle

Answer: C

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12. The vertical distance between the minimum and maximum values of the function y= $\left| -\sqrt{2}\sin\sqrt{3}x \right|$ is

A. 1.141

B. 1.732

C. 2.094

D. 2.828

Answer: A

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13. If the domain of f(x)= $-|x|+2$ is $-1 \leq x \leq 3$ f(x) has a minimum value when x equals

A. -1

B. 0

C. 1

D. 3

Answer: D

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14. What is the ranger of the function $f(x) = x^2 - 14 + \ = 34$?

A. $x \leq 7$

B. $x \geq 0$

C. $y \leq -6$

D. $y \geq -6$

Answer: D

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15. A positive rational root of the equation $4x^3 - x^{216}x - 4 = 0$ is

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

B. $\frac{1}{2}$

C. $\frac{3}{4}$

D. 1

Answer: A

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16. The norm of vector $\vec{V} = 3\vec{i} - \sqrt{2}\vec{j}$ is

A. 4.24

B. 3.61

C. 3.32

D. 2.45

Answer: C

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17. If five coins are flipped and all the different ways they could fall are listed, how many elements of this list will contain more than 3 heads?

A. 5

B. 6

C. 10

D. 16

Answer: B

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18. The seventh term of an arithmetic sequence is 5 and the twelfth term -15. The first term of this sequence is

A. 20

B. 29

C. 30

D. 31

Answer: B

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19. The graph of the curve represented by $\{x = \sec\theta, y = \cos\theta\}$ is

A. a line

B. A hyperbola

C. an ellipse

D. a portion of hyperbola

Answer: D

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20. Point (3,2) lies on the graph of the inverse of $f(x) = 2x^3 + x + A$. The value of A is

A. -54

B. -15

C. 15

D. 18

Answer: B

21. If f(x) $=ax^2+bx+c$ and f(1)=3 and f(-1)=3, then a+c equals

A. -3

B. 0

C. 2

D. 3

Answer: D

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22. In $\triangle ABC, \angle B = 42^\circ, \angle C = 30^\circ$, and AB=100. The length of BC is

A. 47.6

B. 66.9

C. 133.8

D. 190.2

Answer: D

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23. If 4 sinx+3=0 on $0 \leq x < 2\pi$, Then x=

A. -0.848

B. 0.848

C. 5.435

D. 3.990 or 5.435

Answer: D

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24. What is the sum of the infinite geomatric series $6 + 4 + \frac{8}{3} + \frac{16}{9} + ...?$

A. 18

B. 36

C. 45

D. 60

Answer: A

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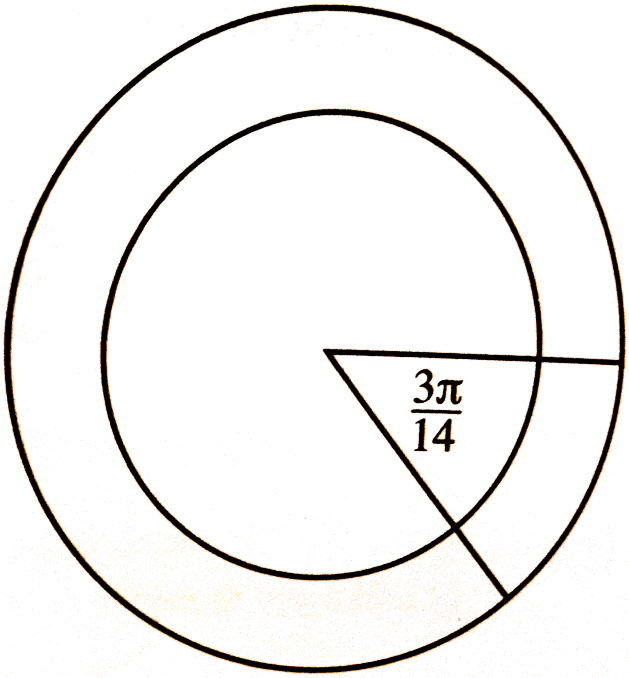
25. In a+bi form, the reciprocal of 2+6i is



A. $\frac{1}{2} + \frac{1}{6}i$

B. $-\frac{1}{16} + \frac{3}{16_i}$

C. $\frac{1}{16} + \frac{3}{16}i$

D. $\frac{1}{20} - \frac{3}{20}i$

Answer: D

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26. A central anglej of two concentric circles is $\frac{3\pi}{14}$. The area of the large sector. What is the ratio of the lengths of the radii of the two circles?

A. 0.25:1

B. 0.50:1

C. 0.67:1

D. 0.71:1

Answer: D

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27. If the region bounded by the lines $y = -\frac{4}{3}x + 4$, x=0 , and y=0 is rotated about the y-axis, the volume of the figure formed is

A. 18.8

B. 37.7

C. 56.5

D. 84.8

Answer: B

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28. If there are known to be 4 broken transistors in a box of 12, and 3 transistors are

drawn at random, what is the probability that none of the 3 is broken?

A. 0.25

B. 0.255

C. 0.375

D. 0.556

Answer: B

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29. What is the domain of f(x)=$3\sqrt{15 - x^2}$?

A. xgt0

B. xgt2.47

C. -2.47ltxlt2.47

D. all real numbers

Answer: D

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30. Which of the following is horizontal asymptote to the function f(x)= $\frac{3x^4 - 7x^3 + 2x^2 + 1}{2x^4 - 4}$?

A. y=-3.5

B. y=0

C. y=0.25

D. y=1.5

Answer: D

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31. When a certain radioactive elements decays, the amount at any time t can be calculated using the function E(t)=$ae^{\frac{-t}{500}}$, where a is the original amound an t is the elapsed time in year.How many years would it take for an initial amount of 250 miligrams of this element to decay to 100 miligrams?

A. 125 years

B. 200 years

C. 458 years

D. 496 years

Answer: C

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32. If n is an integer, what is the remainder when $3x^{2n+3} - 4x^{2n+2} + 5x^{2n+1} - 8$ is divided by x+1 ?

A. -20

B. -10

C. -4

D. 0

Answer: A

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33. Four men A,B,C and D, line up in a row. What is the probability that man A is at either end of the row?

A. $\frac{1}{2}$

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

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

D. $\frac{1}{6}$

Answer: A

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34. $\sum_{i=3}^{10} 5$

A. 260

B. 50

C. 40

D. 5

Answer: C

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35. The graph of $y^4 - 3x^2 + 7 = 0$ is symmetric with respect to which of the following?

the x-axis

the y-axis

the origin

A. only I

B. only II

C. only III

D. I, II, and III

Answer: D

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36. In a group of 30 students, 20 take French, 15 take Spanish, and 5 take neither language. How many students take both French and Spanish?

A. 0

B. 5

C. 10

D. 15

Answer: C

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37. If f(x)=x^2 , then $\frac{f(x+h)-f(x)}{h}$=

A. 0

B. h

C. 2x

D. 2x+h

Answer: D

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38. The plane Whose equation is $5x+6y+10z=30$ forms a pyramid in the first octant with the coordinate planes. Its volume is

A. 15

B. 21

C. 30

D. 36

Answer: A

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39. What is the range of the function f(x)= $\frac{3}{x-5}-1$?

A. All real numbers

B. All real numbers except 5

C. All real numbers except 0

D. All real numbers except-1

Answer: D

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40. Given the set of data 1,1,2,2,2,3,3,x,y, where x and y represent two different integers. If the mode is 2, which of the following statements must be true?

A. If x=1 or 3, then y must=2

B. Both x and y must be gt 3

C. Either x or Y must =2

D. It does not matter what values x and y have

Answer: A

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41. If f(x)=$\sqrt{2x+3}$ and g(x)=x^2 , for what value (s) of x does f(g(x))=g(f(x))?

A. -0.55

B. 0.46

C. 5.45

D. -0.55 and 5.45

Answer: A

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42. If $3x - x^2 \geq 2$ and $y^2 + y \leq 2$, then

A. $-1 \leq xy \leq 2$

B. $-2 \leq xy \leq 2$

C. $-4 \leq xy \leq 4$

D. $-4 \leq xy \leq 2$

Answer: D

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43. In $\triangle ABC$, if sin A=$\frac{1}{3}$ and sin B=$\frac{1}{4}$, sin C=

A. 0.14

B. 0.54

C. 0.56

D. 3.15

Answer: C

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44. The solution set of $\frac{|x-1|}{x} > 2$ is

A. $0 < x < \frac{1}{3}$

B. $x < \frac{1}{3}$

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

D. $\frac{1}{3} < x < 1$

Answer: A

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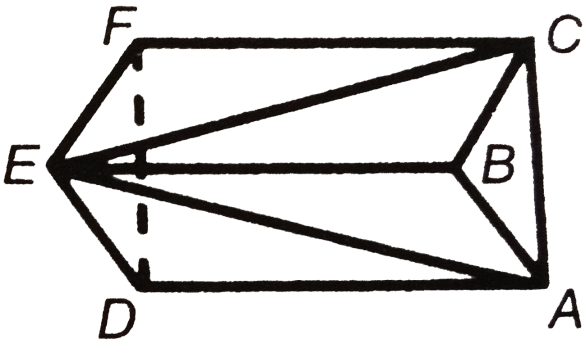
45. Suppose the graph of f(x)=$-x^3 + 2$ is translated 2 units right and 3 units down. If the result is the graph of Y=g(x), what is the

value of g(-1.2)?



A. -33.77

B. -1.51

C. -0.49

D. 31.77

Answer: D

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46. In the figure above, the bases , ABC and DEF, of the right prism are equilateral triangles. The altitude of the prism is BE. If a plane cuts the figure through points A, C and E, two solids, EABC, and EACFD, are formed. What is the ratio of the volume of EABC to the volume of EACFD?

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

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

C. $\frac{\sqrt{3}}{4}$

D. $\frac{1}{2}$

Answer: D

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47. The range of the piecewise function

$$f(x) = \begin{cases} 3(x-1)^2 - 2 & \text{if } x < 6 \\ -2x + 5 & \text{if } x \geq 6 \end{cases}$$

A. $(-\infty, \infty)$

B. $(-\infty, -7)$

C. $[-2, \infty)$

D. $(-\infty, -7] \cup [-2, \infty)$

Answer: D

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48. The length of the major axis of the ellipse $3x^2 + 2y^2 - 6x8y - 1 = 0$ is

A. $\sqrt{3}$

B. $\sqrt{6}$

C. $2\sqrt{3}$

D. $2\sqrt{6}$

Answer: D

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49. A recent survey reported that 60 percent of the students at a high school are girls and 65 percent of girls at this school play a sport. If a student at this high school were selected

at random, what is the probability that the student is a girl who plays a sport?

A. 0.1

B. 0.21

C. 0.32

D. 0.42

Answer: D

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50. If x-7 divides $x^3 - 3k^3x^2 - 13x - 7$, then k=

A. 1.19

B. 1.34

C. 1.72

D. 4.63

Answer: A

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