MATHS

BOOKS - INDEPENDENTLY PUBLISHED MATHS (ENGLISH)

MODEL TEST 1

Mcqs

1. The slope of a line perpendicular to the line whose equation is $\frac{x}{3} - \frac{y}{4} = 1$ is

A. -3

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

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

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

Answer: C

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2. What is the range of the data set 8,12,12,15,18?

A. 10

B. `12

C. 13

D. 15

Answer: A

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3. If $f(x) = \frac{x-7}{x^2-49}$, for what value(s) of x does the graph of y=f(x) have a vertical asymptote?

A. -7

B. 0

C. $-7, 0, 7$

D. $-7, 7$

Answer: A

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4. If $f(x) = \sqrt{2x+3}$ and $g(x) = x^2 + 1$, then $f(g(2)) =$

A. 2.24

B. 3

C. 3.61

D. 6

Answer: C

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5. What is the value of x if $4^{x+1} = 8^x$?

A. -1

B. 0

C. 1

D. 2

Answer: D

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6. The circumference of circle $x^2 + y^2 - 10y - 36 = 0$ is

A. 38

B. 49

C. 54

D. 125

Answer: B

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7. Twenty-five percent of a group of unrelated students are only children. The students are asked one at a time whether they are only

children. What is the probability that the 5th student asked is the first only child?

A. 0.00098

B. 0.08

C. 0.24

D. 0.25

Answer: B

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8. If $f(x) = 2$ for all real numbers x, then $f(x + 2) =$

A. 0

B. 2

C. 3

D. x

Answer: B

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9. The volume of the regtion between two concentric spheres of radii 2 and 5 is

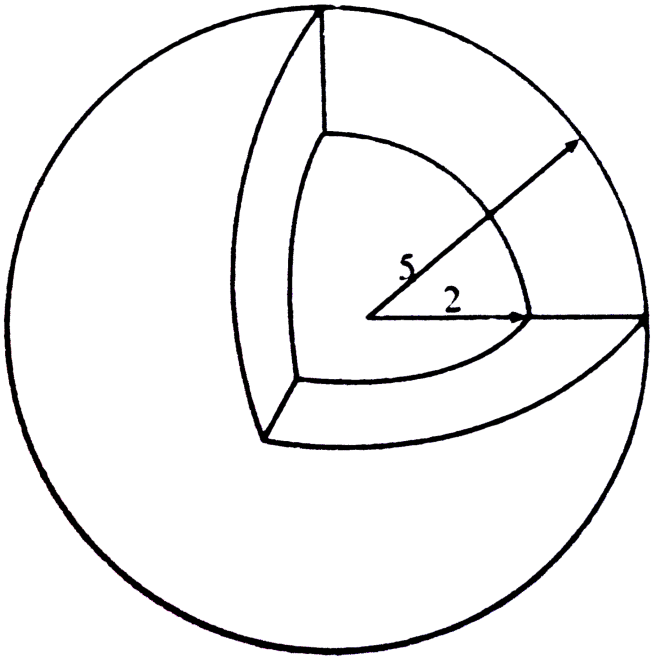

Figure not drawn to scale

A. 28

B. 66

C. 113

D. 490

Answer: D

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10. If a,b and c are real numbers and if $a^5b^3c^8 = \frac{9a^3c^8}{b^{-3}}$, then a could equal

A. $\frac{1}{9}$

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

C. 9

D. 3

Answer: D

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11. In right triangle, ABC, AB=10,BC=8,AC=6.

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

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

C. $\frac{4}{5}$

D. $\frac{5}{4}$

Answer: C

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12. if $16^x = 4$ and $5^{x+y} = 625$, then y=

A. 1

B. 2

C. $\frac{7}{2}$

D. 5

Answer: C

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13. If the parameter is eliminated from the equations $x = t^2 + 1$ and $y = 2t$, then the relation between x and y is

A. $y = x - 1$

B. $y = 1 - x$

C. $y^2 = x - 1$

D. $y^2 = 4x - 4$

Answer: D

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14. Let f(x) be a polynomial function: $f(x) = x^5 + \ldots.$ if f(1)=0 and f(2)=0, then f(x) is divisible by

A. $x - 3$

B. $x^2 - 2$

C. $x^2 + 2$

D. $x^2 - 3x + 2$

Answer: D

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15. If

$x - y = 2, y - z = 4,$ and $x - y - z = -3$

, then y=

A. 1

B. 5

C. 9

D. 11

Answer: C

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16. If $z > 0, a = z\cos\theta,$ and $b = z\sin\theta,$ then $\sqrt{a^2 + b^2}$=

A. 1

B. z

C. 2z

D. $z\cos\theta\sin\theta$

Answer: B

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17. If the vertices of a triangle are `(u,0),(v,8), and (0,0) then the area of the triiangle is

A. $4|u|$

B. $2|v|$

C. $|uv|$

D. $2|uv|$

Answer: A

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18. What is the difference between the min and max values of the function f defined by $f(x) = 2x^2 + 3x - 8$ on the interval $[-2, 5]$?

A. 7

B. 57.75

C. 63

D. 66.13

Answer: D

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19. What is the probability that a prime number is less than 7, given that it is less than 13?

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

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

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

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

Answer: D

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20. The ellipse $4x^2 + 8y^2 = 64$ and the circle $x^2 + y^2 = 9$ intersect at points where the y-coordinates is

A. $\pm\sqrt{2}$

B. $\pm\sqrt{5}$

C. $\pm\sqrt{6}$

D. $\pm\sqrt{7}$

Answer: D

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21. Each term of a sequence, after the first, is inversely proportional to the term preceding it. If the first two terms are 2 and 6, what is the twelfth them?

A. 2

B. 6

C. 46

D. $2 \cdot 3^{11}$

Answer: B

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22. A company offers you the use of its computer for a fee. Plan A costs $4 6 to join and then $9 per hour to use the compound. Plan B costs $25 to join and then $2.25 per hour to use the computer. After how many minutes of use would the cost of plan A be the samee as the cost of plan B?

A. 18052

B. 173

C. 169

D. 165

Answer: C

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23. if the probability that the Giants will win the NFC championship is p and if the probability that the raiders will wini the AFC

championship is q, what is the probability that only one of these teams will win its respectgive championship?

A. pq

B. $p + q - 2pq$

C. $|p - q|$

D. $1 - pq$

Answer: B

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24. What is the sum of the infinite geometric series whose first two terms are 3 and 1?

A. 1.5

B. 4.5

C. 9

D. 12

Answer: B

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25. The value of $\frac{453!}{450!3!}$ is

A. greater than 10^{100}

B. between 10^{10} and 10^{100}

C. betweenn 10 and 10^{10}

D. less than 10

Answer: C

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26. If S is the angle formed by the line $2y = 3x + 7$ and the axis, then $\angle A$ equals

A. -45°

B. 0°

C. 56°

D. 72°

Answer: C

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27. A U.S. dollar equals 0.716 European euros, and a Japanese yen equals 0.00776 European euros. How many U.Sgt dollars equal a Japanese yen?

A. 0.0056

B. 0.011

C. 94.2

D. 179.98

Answer: B

28. If $(x-4)^2+4(y-3)^2=16$ is graphed, the sum cf the distances from any fixed point on the curve to the two foci is

A. 4

B. 8

C. 12

D. 16

Answer: B

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29. In the equation $x^2 + kx + 54 = 0$, one root is twice the other root. The value(s) of k is (are)

A. -5.2

B. ± 15.6

C. 22.0

D. ± 5.2

Answer:

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30. The remainder obtained when $3x^4 + 7x^3 + 8x^2 - 2x - 3$ is divided by x+1 iss

A. -3

B. 0

C. 3

D. 5

Answer: C

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31. If $f(x) = e^x$ and $g(x) = f(x) + f^{-1}$, what does g(2) equal?

A. 5.1

B. 7.4

C. 7.5

D. 8.1

Answer: D

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32. if $x_0 = 3$ and $x_{n+1} = \sqrt{4 + x_n}$, then $x_3 =$

A. 2.65

B. 2.58

C. 2.56

D. 2.55

Answer: C

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33. For what values of k does the graph of $\frac{(x-2k)^2}{1} - \frac{(y-3k)^2}{3} = 1$ pass through the origin?

A. only 0

B. only 1

C. ± 1

D. $\pm\sqrt{5}$

Answer: C

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34. if $\frac{1-\cos\theta}{\sin\theta} = \frac{\sqrt{3}}{3}$, then θ=

A. 15°

B. 30°

C. 45°

D. 60°

Answer: D

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35. if

$x^2 + 3x + 2 < 0$ and $f(x) = x^2 - 3x + 2$,

then

A. $0 < f(x) < 6$

B. $f(x) \geq \frac{3}{2}$

C. $f(x) > 12$

D. $f(x) > 0$

Answer:

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36. If $f(x) = |x| + [x]$, where [x] is the greatest integer less than or equal to x, the value of $f(-2.5) + f(1.5)$ is

A. -2

B. 1

C. 1.5

D. 2

Answer: D

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37. If $(\sec x)(\tan x) < 0$, which of the following must be true?

I. $\tan x < 0$

II. Csc x cot $x < 0$

III. X is in the third or fourth quadrant

A. I only

B. II only

C. III only

D. II and III

Answer: C

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38. At the end of a meeting all participants shook hands with each other. Twenty-eight handshakes were exchanged. How many people were at the meeting?

A. 7

B. 8

C. 14

D. 28

Answer: B

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39. Suppose the graph of $f(x) = 2x^2$ is translated 3 units down and 2 units right. If the resulting graph represents the graph of g(x), what is the value of $g(-1.2)$?

A. -1.72

B. -0.12

C. 2.88

D. 17.48

Answer: D

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40.

x	-5	-3	-1	1
y	0	4	-3	0

Four points on the graph of a polynomial P are shown in the table above. If P is a polynomial

of degree 3, then P(x) could equal

x	-5	-3	-1	1
y	0	4	-3	0

A. a(x-5)(x-2)(x+1)

B. a(x-5)(x+2)(x+1)

C. a(x+5)(x-2)(x-1)

D. a(x+5)(x+2)(x-1)

Answer: D

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41. If $f(x) = ax + b$, which of the following make(s) $f(x) = f^{-1}(x)$?

I. a=-1, b=any real number

II. A=1, b=0

III. A=any real number, b=0

A. Only I

B. Only II

C. only III

D. Only I and II

Answer: D

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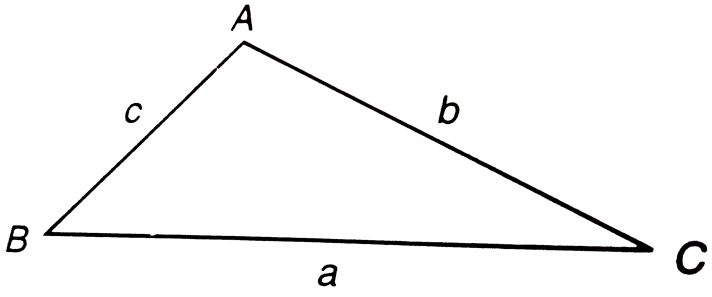
42. In the figure above, $\angle A = 110^\circ, a = \sqrt{6}$, and $b = 2$. what is the value of $\angle C$?



A. 50°

B. 25°

C. 20°

D. 15°

Answer: C

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43. If vector $\overrightarrow{v} = (1, \sqrt{3})$ and vector $\overrightarrow{u} = (3, -2)$ find the value of $\left|3\overrightarrow{v} - \overrightarrow{u}\right|$

A. 5.4

B. 6

C. 7

D. 7.2

Answer: D

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44. If $f(x) = \sqrt{x^2 - 1}$ and $g(x) = \frac{10}{x + 2}$, then $g(f(3))$=

A. 0.2

B. 1.7

C. 2.1

D. 3.5

Answer: C

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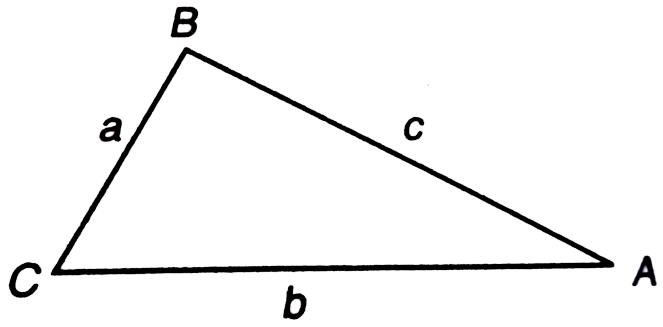

45.

In $\triangle ABC$ above, a=2x, b=3x+2, c=$\sqrt{12}$, and

$\angle C = 60^\circ$. Find x.

A. 0.50

B. 0.64

C. 0.77

D. 1.64

Answer: B

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46. If $\log_a 5 = x$ and $\log_a 7 = y$, then $\log_a \sqrt{1,4} =$

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

B. $\frac{1}{2}x - y$

C. $\frac{1}{2}(x + y)$

D. $\frac{1}{2}(y - x)$

Answer: D

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47. If $f(x) = 3x^2 + 4x + 5$, what must the value of k equal so that the graph of $f(x - k)$ will be symmetric to the y-axis?

A. -4

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

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

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

Answer: D

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48. If $f(x) = \cos x$ and $g(x) = 2x + 1$, which of the following are even functions?

I. $f(x) \cdot g(x)$

II $f(g(x))$

III. $g(f(x))$

A. only I

B. only II

C. only III

D. Only I and II

Answer: C

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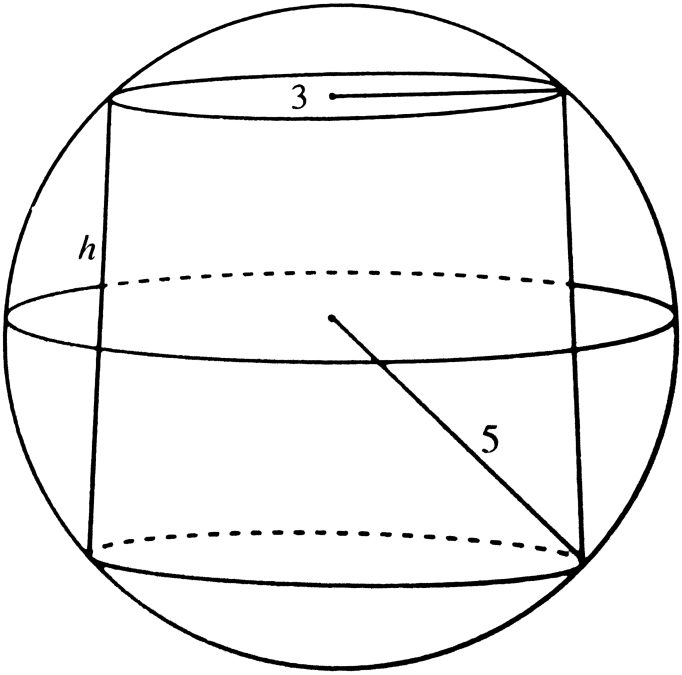

49.

A cylinder whose base radius is 3 is inscribed in a sphere of radius 5. what is the difference

between the volume of the sphere annd the volume of the cylinder?

A. 88

B. 297

C. 354

D. 448

Answer: B

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50. Under which conditions is $\frac{xy}{x-y}$ negative?

A. $0 < y < x$

B. $x < y < 0$

C. $x < 0 < y$

D. $y < x < 0$

Answer: B

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