

JAMB

Mathematics

Past questions

Paper Type: **Objective (PT. 6-10)**

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JAMB MATHEMATICS PAST QUESTIONS (PT.6)

1. Without using tables, evaluate

$$\log_2 4 + \log_4 2 - \log_{25} 5$$

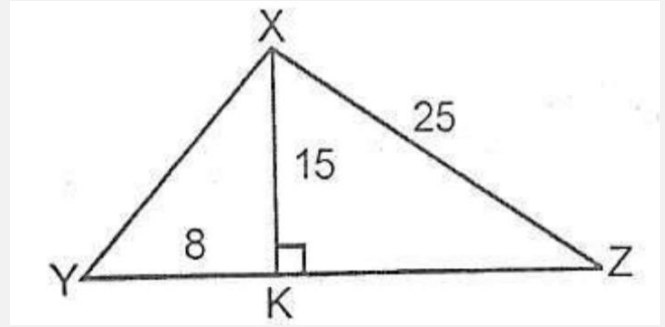
- A. $\frac{1}{2}$
- B. $\frac{1}{5}$
- C. 0
- D. 2

2. Find the values of p for which the equation $x^2 - (p-2)x + 2p + 1 = 0$ has equal roots.

- A. (0, 12)
- B. (1, 2)
- C. (21, 0)
- D. (4, 5)

3. Solve the simultaneous equation $2x - 3y = 10$, $10x - 6y = 5$

- A. $x = 2\frac{1}{2}$, $y = 3\frac{1}{3}$
- B. $x = 3\frac{1}{2}$, $y = 2\frac{1}{2}$
- C. $x = 2\frac{1}{4}$, $y = 3$
- D. $x = 3\frac{1}{2}$, $y = 2\frac{1}{5}$



4. In ΔXYZ above, $\angle XKZ = 90^\circ$, $XK = 15 \text{ cm}$, $XZ = 25 \text{ cm}$ and $YK = 8 \text{ cm}$. Find the area of ΔXYZ .

- A. 180 sq.cm
- B. 20sq cm
- C. 160sq. cm
- D. 320 sq.cm

5. Simplify $3\frac{1}{3} - 1\frac{1}{4} \times \frac{2}{3} + 1\frac{2}{5}$

- A. $2\frac{17}{30}$
- B. $3\frac{9}{10}$
- C. $4\frac{1}{10}$
- D. $4\frac{11}{36}$

6. Factorize $1 - (a - b)^2$

- A. $(1 - a - b)(1 - a + b)$
- B. $(1 - a + b)(1 + a - b)$
- C. $(1 - a + b)(1 - a + b)$

D. $(1 - a - b)(1 + a - b)$

7. Find the range of value of x which satisfy the inequality

$$\left(\frac{x}{2} + \frac{x}{3} + \frac{x}{4}\right) < 1$$

A. $x < \frac{12}{13}$

B. $x < 13$

C. $x < 3$

D. $x < \frac{13}{12}$

8. A crate of soft drinks contains 10 bottles of Coca-Cola, 8 of Fanta and 6 of Sprite, if one bottle is selected at random, what is the probability that it is NOT a Coca-Cola bottle?

A. $5/12$

B. $1/3$

C. $3/4$

D. $7/12$

9. The gradient of curve is $2x + 1$ and the curve passes through point $(2, 0)$. Find the equation of the curve.

A. $y = x^2 + 7x + 9$

B. $y = x^2 + 7x - 18$

C. $y = x^2 + 7x + 9$

D. $y = x^2 + 14x + 11$

10. Differentiate $(\cos q - \sin q)^2$ with respect to q .

A. $-2 \cos 2q$

B. $-2 \sin 2q$

C. $1 - 2 \cos 2q$

D. $1 - 2 \sin 2q$

11. If $\tan q = 5/4$, find $\sin 2q - \cos 2q$.

A. $5/4$

B. $41/9$

C. $9/41$

D. 1

12. Find the value of x if the expression $kx^2 + x - 5x - 2$ leaves a remainder 2 when it is divided by $2x + 1$.

A. 10

B. 8

C. -10

D. -8

13. If $y = x^2 - x - 12$, find the range of values of x for which $y \geq 0$.

A. $x < -2$ or $x > 4$

B. $x \leq -3$ or $x \geq 4$

C. $-3 < x \leq 4$

D. $-3 \leq x \leq 4$

14. A man bought a second-hand photocopying machine for ₦34 000. He served it at a cost of ₦2,000 and then sold it at a profit of 15%. What was the selling price?

A. ₦37, 550

B. ₦40, 400

C. ₦41, 400

D. ₦42, 400

15. Find the radius of a sphere whose surface area is 154 cm^2

A. 7.00 cm

B. 3.50 cm

C. 3.00 cm

D. 1.75cm

16. The sum of the first n terms of the arithmetic progression 5, 11, 17, 23, 29, 35,... is _____

A. $(3n - 0)$

B. $(3n + 2)$

C. $(3n + 2.5)$

D. $(3n + 5)$

17. What value of x will make the function $(4 - x)$ a maximum?

A. 4

B. 3

C. 2

D. 1

18. In how many ways can a delegation of 3 be chosen from 5 men and 3 women, if at least 1 man and 1 woman must be included?

A. 15

B. 28

C. 30

D. 45

19. The table above shows the distribution of marks of students in an test. Find the probability of passing the test if the pass mark is 5

- A. $\frac{3}{5}$
- B. $\frac{4}{9}$
- C. $\frac{7}{20}$
- D. $-\frac{1}{5}$

20. A student measures a piece of rope and found that it was 1.26m long. If the actual length of the rope was 1.24 m, what was the percentage error in the measurement?

- A. 0.40%
- B. 0.01%
- C. 0.25%
- D. 0.80%

21. Rationalize $\frac{2\sqrt{3}+\sqrt{5}}{\sqrt{5}-\sqrt{3}}$

- A. $\frac{3\sqrt{12}+11}{2}$
- B. $\frac{3\sqrt{15}-11}{2}$
- C. $3\sqrt{15} - 11$

D. $3\sqrt{15} + 11$

22. Solve the inequalities $-6 \leq 4 - 2x < 5 - x$

- A. $-1 \leq x < 6$
- B. $-1 < x \leq 5$
- C. $-1 < x < 5$
- D. $-1 \leq x \leq 6$

23. A cylindrical pipe 5cm long with radius 7m has one end open. What is the total surface area of the pipe?

- A. $100\pi m^2$
- B. $98\pi m^2$
- C. $350\pi m^2$
- D. $749\pi m^2$

24. Find the standard deviation of 2, 3, 5 and 6

- A. $\sqrt{5/2}$
- B. $\sqrt{10}$
- C. $\sqrt{6}$
- D. $\sqrt{2/5}$

25. Without using tables evaluate $(343)^{-1/3} \times (0.14) - 1 \times (25)^{-1/2}$

- A. 10
- B. 12
- C. 8
- D. 7

26. Given that $\log_4 (y - 1) + \log_4 (1/2 x) = 1$ and $\log_2 (y + 1) + \log_2 = 2$, solve for x and y respectively.

- A. 2, 3
- B. 3, 2
- C. -2, -3
- D. -3, -2

27. When the expression $pm^2 + qm + 1$ is divided by $(m-1)$, it has a remainder 2 and when divided by $(m+1)$ the remainder is 4. Find p and q respectively.

- A. 2, -1
- B. -1, 2
- C. 3, -2
- D. -2, 3

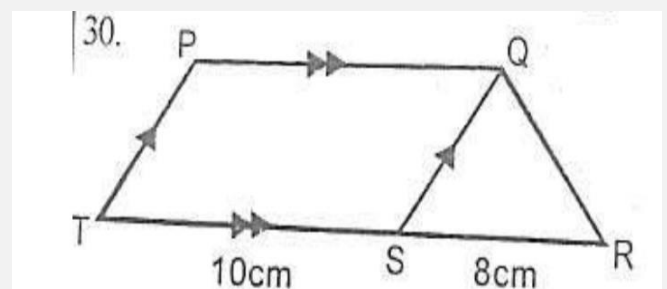
28. Divide $2x^3 + 11x^2 + 17x + 6$ by $2x + 1$

- A. $x^2 + 5x + 6$
- B. $2x^2 + 5x + 6$
- C. $2x^2 - 5x + 6$
- D. $x^2 - 5x + 6$

⊗	p	q	r	s
p	r	p	r	p
q	p	q	r	s
r	r	r	r	r
s	q	s	r	q

29. The identity element with respect to the element shown in the table above is _____

- A. p
- B. q
- C. r
- D. s



30. In the figure above, PQST is a parallelogram and TSR is a straight line. If the area of ΔQRS is 20cm^2 , find the area of the trapezium PQRT.

- A. 35cm^2
- B. 65cm^2
- C. 70cm^2
- D. 140cm^2

31. The mid-point of the segment of the line $y = 12 \times 15$ which lies between the x-axis and y-axis is

- A. $(-\frac{2}{2}, \frac{3}{2})$
- B. $(-\frac{2}{3}, \frac{3}{2})$
- C. $(\frac{3}{8}, \frac{3}{2})$
- D. $(-\frac{3}{6}, \frac{3}{2})$

32. Find the equation of the curve which passes through the point (2, 5) and whose gradient at any point is given by $6x - 5$

- A. $6x^2 - 5x$
- B. $6x^2 + 5x + 5$
- C. $3x^2 - 5x - 5$

D. $3x^2 - 5x + 3$

33. $\frac{0.0001432}{1940000} = k \times 10^n$ where $1 \leq K < 10$ and n is a whole number. The value of K and n are _____

- A. 7.381 and -11
- B. 2.34 and 10
- C. 3.871 and 2
- D. 7.831 and -11

34. Thirty boys and x girls sat for a test. The mean of the boys' scores and that of the girls were respectively 6 and 8. Find x if the total score was 468.

- A. 38
- B. 24
- C. 36
- D. 22

35. Rationalize $\frac{5\sqrt{7}-7\sqrt{5}}{\sqrt{7}-\sqrt{5}}$

- A. $-2\sqrt{35}$
- B. $\sqrt{7} - 6\sqrt{5}$
- C. $-\sqrt{35}$
- D. $4\sqrt{7}$

36. If $2x + 3y = 1$ and $x - 2y = 11$, $(x + y)$

- A. 5
- B. -3
- C. 8
- D. 2

37. A car dealer bought a second-hand car for ₦250,000.00 and spent ₦70,000.00 refurbishing it. He then sold the car for ₦400,000.00. What is the percentage gain?

38. Simplify $(\sqrt[3]{640^3})^{-1}$

- A. 80
- B. 40
- C. 1/40
- D. 1/80

39. Find the value of p if the line joining $(p, 4)$ and $(6, -2)$ is perpendicular to the line joining $(2, p)$ and $(-1, 3)$.

- A. 0
- B. 3

- C. 4
- D. 6

40. Find the number of sides of a regular polygon whose interior angle is twice the exterior angle.

- A. 2
- B. 3
- C. 6
- D. 8

CHECK YOUR ANSWERS

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JAMB MATHEMATICS PAST QUESTIONS (PT.7)

1. If $\frac{dy}{dx} = 2x - 3$ and $y = 3$ when $x = 0$, Find y in terms of x

- A. $2x^2 - 3x$
- B. $x^2 - 3x$
- C. $x^2 - 3x - 3$
- D. $x^2 - 3x + 3$

2. If $P = \begin{pmatrix} 2 & 1 \\ -3 & 0 \end{pmatrix}$ and I is a 2×2 -unit matrix. Evaluate $P^2 - 2P + 4I$

- A. $\begin{pmatrix} 9 & 4 \\ -12 & 1 \end{pmatrix}$
- B. $\begin{pmatrix} -3 & 0 \\ 0 & -3 \end{pmatrix}$
- C. $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
- D. $\begin{pmatrix} 1 & 4 \\ 4 & 1 \end{pmatrix}$

3. Find the value of x if the line $2y - ax + 4 = 0$ is perpendicular to the line $y + \frac{1}{4}x - 1 = 0$

- A. -4
- B. 4
- C. 8
- D. -8

4. Calculate the mean deviation of the sets of numbers 7, 3, 14, 9, 7 and 8.

- A. $2\frac{1}{6}$
- B. $2\frac{1}{2}$
- C. $1\frac{1}{6}$
- D. $2\frac{1}{3}$

5. The graph of the function $y = x^2 + 4$ and a straight-line PQ are drawn to solve the equation $x^2 - 3x + 2 = 0$. What is the equation PQ?

- A. $y = 3x - 2$
- B. $y = 3x + 2$
- C. $y = 3x - 4$
- D. $y = 3x + 4$

6. If $\frac{\pi}{2} \leq \theta < 2\pi$, find the maximum value of $(\theta) = \frac{4}{6+2005\theta}$

- A. 4
- B. 1
- C. $\frac{2}{3}$
- D. $\frac{1}{3}$

7. On a pie chart, there are four scores of which three angles are 45° , 90° and 35° , if the smallest sector represents ₦28.00, how much is the largest sector?

- A. ₦96.00
- B. ₦84.00
- C. ₦48.00
- D. ₦42.00

8. The result of missing a fair dice 120 times is summarize is above, find the value of x.

- A. 19
- B. 20
- C. 21
- D. 22

9. Given $\mu = \{\text{even number between 0 and 30}\}$

$P = \{\text{Multiples of 6 between 0 and 30}\}$

$Q = \{\text{Multiples of 4 between 0 and 30}\}$

Find (PUQ)

- A. {2, 10, 14, 22, 26}
- B. {2, 10, 14, 22, 26}

C. {2, 4, 14, 18, 26}

D. {0, 2, 6, 22, 26}

$$\begin{array}{r}
 10. \quad 4 \quad 2 \quad 4 \quad 3 \\
 \quad -1 \quad 3 \quad x \quad 4 \\
 \hline
 \quad Y \quad 3 \quad 4 \quad 4 \\
 \hline
 \end{array}$$

Find x and y respectively in the subtraction above carried out in base 5.

- A. 2, 4
- B. 3, 2
- C. 4, 2
- D. 4, 3

11. Factorise completely $x^2(x - a^2 + 4b^2)$

- A. $(a - 2b)(c + a - 2b)$
- B. $(a - 2b)(-a - 2b)$
- C. $(a - 2b)(c + a - 2b)$
- D. $(a - 2b)(c - a + 2b)$

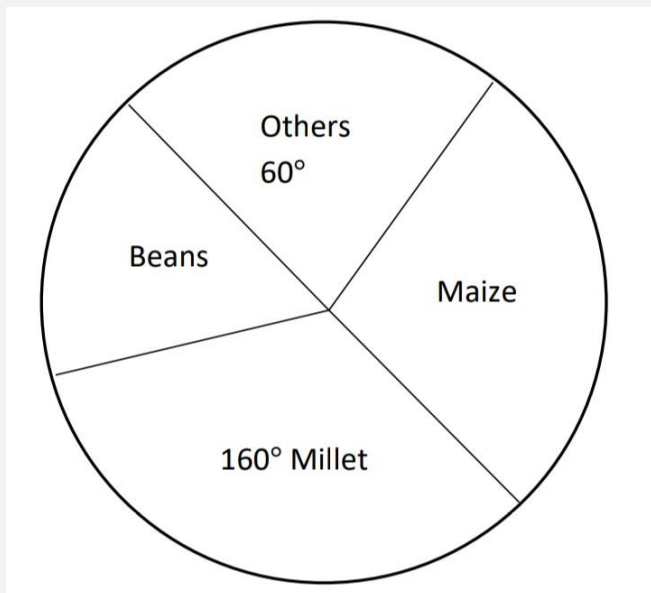
12. PQRSTN is a regular polygon of side 7cm. Inscribed in a circle,

find the circumference of the circle PQRSTV

- A. 12cm
- B. 42cm
- C. 44cm
- D. 56cm

13. The shadow of a pole $5\sqrt{3}$ high is 5.5cm. Find the angle of elevation of the sun.

- A. 50
- B. 45
- C. 60
- D. 75



14. The pie chart above shows the distribution of the crops harvested from a farmland in a year. If 3000

tonnes of millet is harvested, what amount of beans is harvested?

- A. 9000 tonnes
- B. 6000 tonnes
- C. 1500 tonnes
- D. 1200 tonnes

15. A container has 30 gold medals, 22 silver medals and 18 bronze medals. If one medal is selected at random from the container, what is the probability that it is not a gold medal?

- A. $\frac{4}{7}$
- B. $\frac{3}{7}$
- C. $\frac{11}{35}$
- D. $\frac{9}{35}$

16. A polynomial in x whose zeros are $-2, -1$ and 3 is _____

- A. $x^3 - 7x + 6$
- B. $x^3 + 7x - 6$
- C. $x^3 + 7x + 6$
- D. $x^3 - 7x - 6$

17. If M and N are two matrices

defined by $M = \begin{pmatrix} 1 & 3 & 2 \\ 4 & 5 & -1 \\ -3 & 2 & 0 \end{pmatrix}$ and

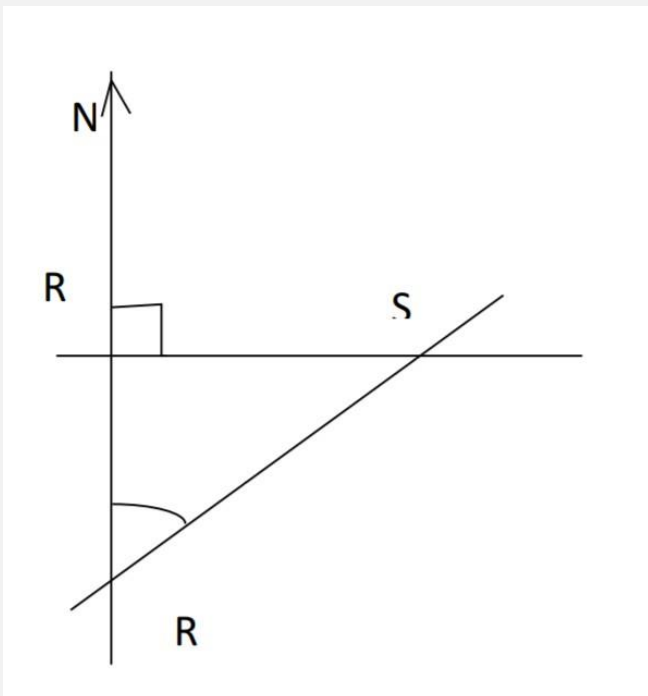
$N = \begin{pmatrix} 1 & -2 & 3 \\ 4 & -1 & 5 \\ 2 & -3 & -1 \end{pmatrix}$. Evaluate $2M - 3N$

A. $\begin{pmatrix} -1 & 12 & 5 \\ 4 & 7 & 3 \\ 0 & -5 & -3 \end{pmatrix}$

B. $\begin{pmatrix} -1 & 0 & -5 \\ -4 & 7 & -17 \\ 0 & -5 & 3 \end{pmatrix}$

C. $\begin{pmatrix} -1 & 12 & -5 \\ -4 & -13 & -17 \\ -12 & 13 & 3 \end{pmatrix}$

D. $\begin{pmatrix} -1 & 12 & -5 \\ 4 & 13 & 13 \\ -12 & 13 & 3 \end{pmatrix}$



18. From the diagram above, find the bearing of **R** from **S**.

A. 226°

B. 224°

C. 136°

D. 134°

19. The mean height and range of heights 1.35, 1.25, 1.35, 1.40, 1.35, 1.45, 1.50, 1.35, 1.50 and 1.20 are m and r respectively. Find $m + 2r$.

A. 1.35

B. 1.65

C. 1.95

D. 3.00

20. What is the probability that an integer x , $\{1 \leq x \leq 20\}$ chosen at random is divisible by both 2 and 3?

A. $1/20$

B. $1/3$

C. $3/20$

D. $7/20$

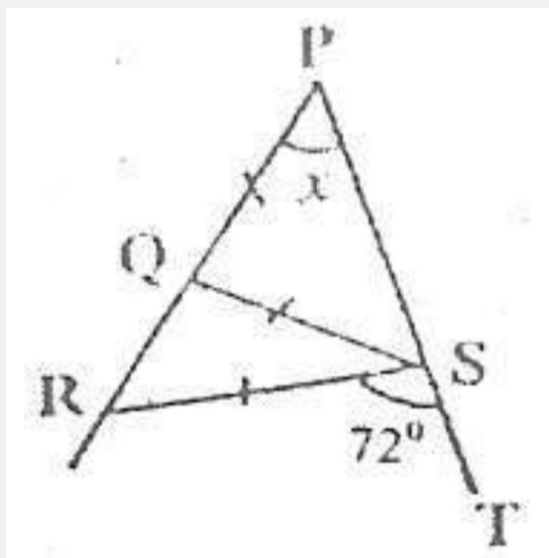
21. A trader bought goats for ₦4000 each. He sold them for

₦180,000 at a loss of 25%. How many goats did he buy?

- A. 60
- B. 50
- C. 45
- D. 36

22. Evaluate $\frac{0.21 \times 0.072 \times 0.00054}{0.006 \times 1.68 \times 0.063}$

- A. 0.01286
- B. 0.01285
- C. 0.1286
- D. 0.1285



23. In the diagram above, **PST** is a straight line, **PQ = QS = RS**. If $\angle RST = 72^\circ$, find x

- A. 36°
- B. 18°

- C. 72°
- D. 24°

24. If $\tan \theta = 4/3$, calculate $\sin 2\theta - \cos 2\theta$

- A. 16/25
- B. 24/25
- C. 7/25
- D. 9/25

25. If $N = \begin{bmatrix} 3 & 5 & -4 \\ 6 & -3 & -5 \\ -2 & 2 & 1 \end{bmatrix}$ find $|N|$

- A. 17
- B. 23
- C. 65
- D. 91

26. A man invested ₦5,000 for 9 months at 4%. What is the simple interest?

- A. ₦150
- B. ₦220
- C. ₦130
- D. ₦250

27. Rationalize $\frac{2-\sqrt{5}}{3-\sqrt{5}}$

A. $\frac{1-\sqrt{5}}{2}$

B. $\frac{1-\sqrt{5}}{4}$

C. $\frac{\sqrt{5}-1}{2}$

D. $\frac{1+\sqrt{5}}{4}$

28. Factorize completely $9y^2 - 16x^2$

A. $(3y - 2x)(3y + 4x)$

B. $(3y + 4x)(3y + 4x)$

C. $(3y + 2x)(3y - 4x)$

D. $(3y + 4x)(3y - 4x)$

29. Solve the inequalities $x^2 + 2x > 15$.

A. $x < -3$ or $x > 5$

B. $-5 < x < 3$

C. $x < 3$ or $x > 5$

D. $x > 3$ or $x < -5$

30. A circle of perimeter 28cm is opened to form a square. What is the maximum possible area of the square?

A. 56 cm^2

B. 49 cm^2

C. 98 cm^2

D. 28 cm^2

31. If two graphs $y = px^2 + q$ and $y = 2x^2 - 1$ intersect at $x = 2$. Find the value of p in terms of q ?

A. $\frac{7+q}{8}$

B. $\frac{8-q}{2}$

C. $\frac{q-8}{7}$

D. $\frac{7-q}{4}$

32. A straight line makes an angle of 30° with the positive x - axis and the y - axis at $y = 5$. Find the equation of the straight line.

A. $\sqrt{3} y = x + 5\sqrt{3}$

B. $\sqrt{3}y = -x5\sqrt{3}$

C. $y = x + 5$

D. $y = \frac{1}{10}x + 5$

33. Find the area bounded by the curves $y = 4 - x^2$ and $y = 2x + 1$.

A. $10\frac{1}{3}$ sq. units

B. $10\frac{2}{3}$ sq. units

C. $20\frac{1}{3}$ sq. units

D. $20\frac{2}{3}$ sq. units

34. Teams **P** and **Q** are involved in a game of football. What is the probability that game ends in a draw?

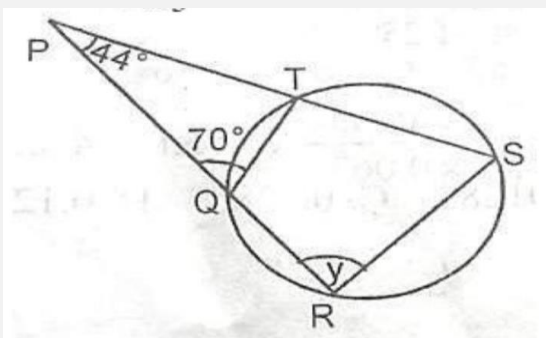
- A. $\frac{1}{4}$
- B. $\frac{1}{3}$
- C. $\frac{1}{2}$
- D. $\frac{2}{3}$

35. Find without using a logarithm

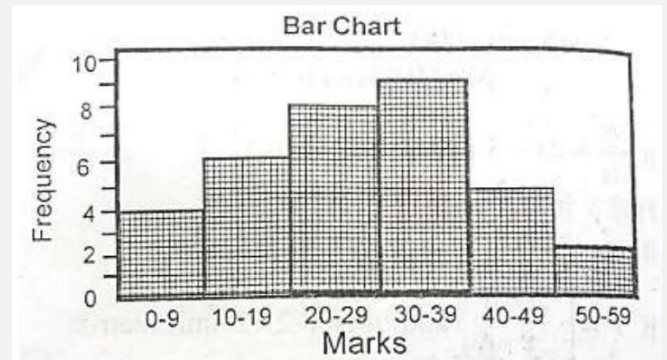
table the value of $\frac{\log_3 27 - \log_1 64}{\log_3 \frac{1}{81}}$

- A. $\frac{7}{4}$
- B. $-\frac{7}{4}$
- C. $-\frac{3}{2}$
- D. $\frac{7}{3}$

36. In the figure below, determine the angle marked y .

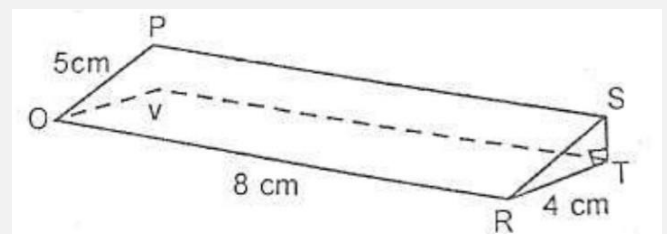


- A. 66°
- B. 110°
- C. 26°
- D. 70°



37. The bar chart above shows the mark distribution in a class test. Find the number of students in the class.

- A. 9
- B. 2
- C. 60
- D. 30



38. What is the volume of the regular three dimensional figure drawn above?

- A. 160 cm^3
- B. 48 cm^3
- C. 96 cm^3
- D. 120 cm^3

39. Find the remainder when $x^3 - 2x^2 + 3x - 3$ is divided by $x^2 + 1$.

- A. $2x - 1$
- B. $x + 3$
- C. $2x + 1$
- D. $x - 3$

40. In a class of 60 students, 30 offer physics and 40 offer Chemistry. If a student is picked at random from the class, what is the probability that the student offers both physics and Chemistry?

- A. $1/3$
- B. $1/4$
- C. $1/2$
- D. $1/6$

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JAMB MATHEMATICS PAST QUESTIONS (PT.8)

$$\begin{array}{rcccc}
 1. & 4 & 2 & 4 & 3 \\
 & -1 & 3 & x & 4 \\
 & \text{-----} & & & \\
 & Y & 3 & 4 & 4
 \end{array}$$

Find the x and y respectively in the subtraction above.

- A. 2, 4
- B. 3, 2
- C. 4, 2
- D. 4, 3

2. Express the product of 0.00043 in Standard form.

- A. 8.6×10
- B. 8.6×10^{-3}
- C. 8.6×10^{-2}
- D. 8.6×10^{-1}

3. Simplify $\frac{2\sqrt{5}-\sqrt{3}}{\sqrt{2}+\sqrt{3}}$

- A. $5\sqrt{6} + 1$
- B. $3\sqrt{6} - 7$
- C. $3\sqrt{6} + 7$
- D. $3\sqrt{6} - 1$

4. If $gt^2 - 4 - w = 0$ make g the subject of the formula.

- A. $\frac{u-w}{t}$
- B. $\frac{u+w}{t^2}$
- C. $\frac{u-w}{t^2}$
- D. $\frac{u+w}{t}$

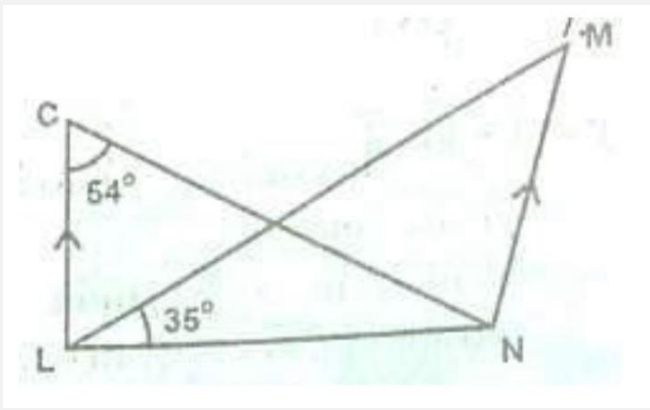
5. Find the value of u if $y - 1$ is a factor of $y^2 + 4y^2 + 4y - 6$

- A. 0
- B. -6
- C. -4
- D. 1

6. Find y if $\begin{pmatrix} 5 & -6 \\ 2 & -7 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 7 \\ -1 \end{pmatrix}$

- A. 2
- B. 8
- C. 5
- D. 3

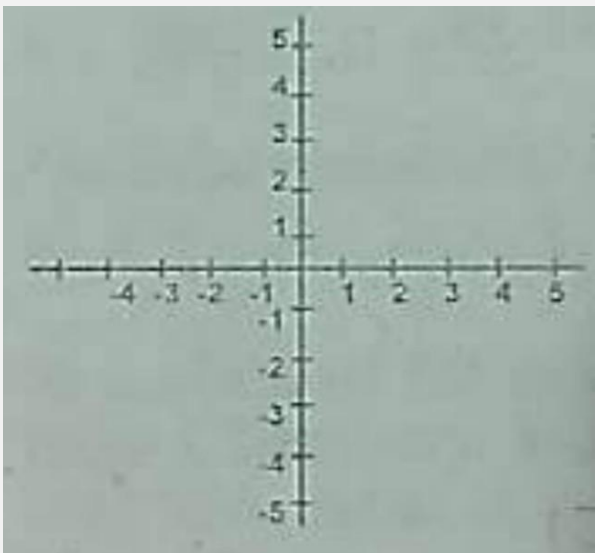
7. In the figure below **KL//NM**, **LN** bisects $\angle KNM$ if the angle **MLN** is 54° and angle **MLN** is 35° . Calculate the size of angle **KMN**



- A. 108°
- B. 91°
- C. 84°
- D. 37°

8. If the angle of a sector of a circle with radius of 10.5cm is 100. Find the perimeter of the sector.

- A. 2.5 m
- B. 3.0 m
- C. 7.5 m
- D. 5.0 m



9. In the figure above, what is the equation of the line that passes the y - axis $(0, 5)$ and passes the x - axis $(5, 0)$

- A. $y = -x - 5$
- B. $-y = x + 5$
- C. $y = -x + 5$
- D. $y = x - 5$

10. A construction company is owned by two partners x and y and it is agreed that their profit will be divided in the ratio 4:5 at the end of the year y received ₦5,000 more than x . What is the total profit of the company per year?

- A. ₦20,000
- B. ₦25,000
- C. ₦50,000
- D. ₦45,000

11. If $x = 1$ is the root of the equation $x^3 - 2x^2 - 5x + 6$. Find the other roots

- A. -3 and 2

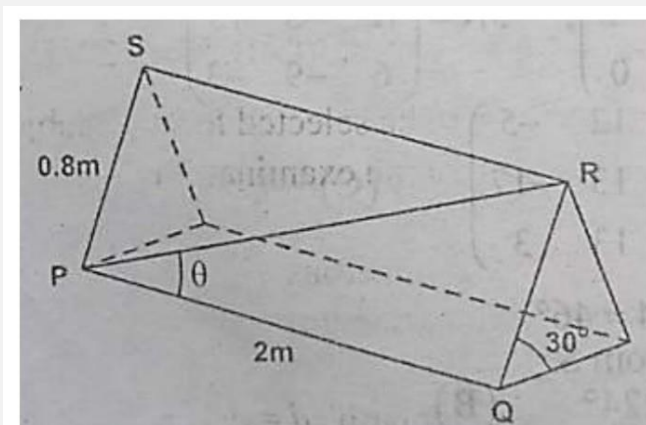
- B. -2 and 2
- C. 3 and -2
- D. 1 and 3

12. If $x + 2$ and $x - 1$ are factors of the expression $1x^3 + 2kx^2 + 24$. Find the value of l and k

- A. $l = -6, k = -2$
- B. $l = -2, k = 1$
- C. $l = -2, k = -1$
- D. $l = 0, k = -1$

13. Simplify $\frac{x-7}{x^2-9} \times \frac{x^2-3x}{x^2-49}$

- A. $\frac{x}{(x-3)(x+7)}$
- B. $\frac{(x+3)(x+7)}{x}$
- C. $\frac{x}{(x-3)(x-7)}$
- D. $\frac{x}{(x+3)(x+7)}$



14. PQRS is a desk of dimension $2m \times 0.8m$ which is inclined at 30° to the horizontal.

- A. $25^\circ, 35'$
- B. 30°
- C. $15^\circ, 36'$
- D. 10°

15. Find the missing point/value in the following road.

X	-2	-1	0	1	2	3
$Y=x^3-x+3$		3	3	3	9	27

- A. -5
- B. 3
- C. -9
- D. 13

16. Correct each of the following 59.81798 and 0.0746829 to three significant figures and multiply them giving your answer to three significant figures.

- A. 4.46
- B. 4.48
- C. 4.47

D. 4.49

17. One interior angle of a convex of hexagon is 170° and each of the remaining angles is equal to x° . Find x .

- A. 120°
- B. 110°
- C. 105°
- D. 102°

18. If $(x) = \frac{1}{x-1} + \frac{x-1}{x^2-1}$. Find $(1-x)$

- A. $\frac{1}{x} + \frac{1}{x-2}$
- B. $x + \frac{1}{2x-1}$
- C. $\frac{-1}{x} + \frac{1}{x-2}$
- D. $\frac{-1}{x} + \frac{1}{x-1}$

19. Convert 241_5 to base 8.

- A. 71_8
- B. 107_8
- C. 176_8
- D. 241_8

20. A train moves from P at Q at an average speed of 40km/hr and

immediately returns from Q is P through the 45km/hr. Find the average speed for the entire journey.

- A. 55 km/hr
- B. 50 km/hr
- C. 67.50km/hr
- D. 75 km/hr

21. By selling 20 oranges for ₦1.35 a trader makes a profit of ₦82. Which is his percentage gain or loss if he sells the same 20 oranges for ₦1.10?

- A. 8%
- B. 10%
- C. 12%
- D. 15%

22. Simplify without using tables

$$\frac{2\sqrt{14} \times 3\sqrt{21}}{7\sqrt{24} \times 2\sqrt{98}}$$

- A. $\frac{3\sqrt{14}}{4}$
- B. $\frac{3\sqrt{2}}{4}$
- C. $\frac{3\sqrt{14}}{28}$

D. $\frac{3\sqrt{2}}{28}$

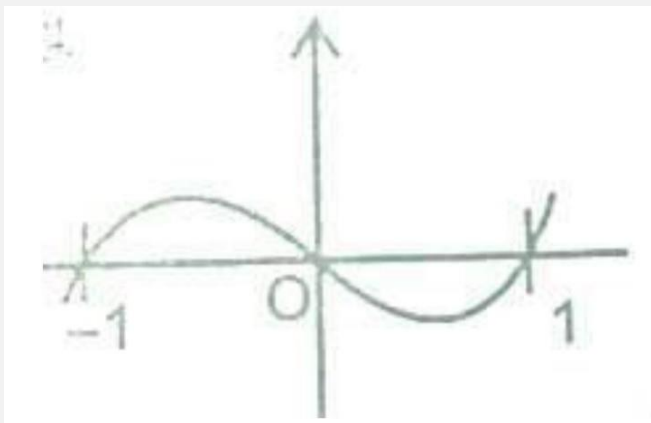
23. Make y the subject of the formula $Z = x^2 + \frac{1}{y^3}$?

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

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

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

D. $y = \frac{1}{3\sqrt{Z}-3\sqrt{x^2}}$



24. A cubic function $f(x)$ is specified by the graph shown above. The values of the independent variable for which the function x .

A. $-1, 0, 1$

B. $-1 \leq x \leq 1$

C. $x < -1$

D. $x > 1$

25. Find the eleventh term of the progression 4, 8, 16, ...

A. 2^{13}

B. 2^{12}

C. 2^{11}

D. 2^{16}

26. The histogram above represents the weight of students who travelled out of their schools for an examination. How many people made the trip?

A. 78

B. 58

C. 29

D. 69

27. In the many ways can 6 subjects be selected from 10 subject be selected from 10 subjects for an examination?

A. 218

B. 216

C. 215

D. 210

28. Find the value of x which the functions $(x) = 2x^2 - x^2 - 4x + 4$ has a maximum value.

- A. $2/3$
- B. 1
- C. $-2/3$
- D. -1

29. Make L the subject of the formula if $d = \sqrt{\frac{42w}{5L}}$

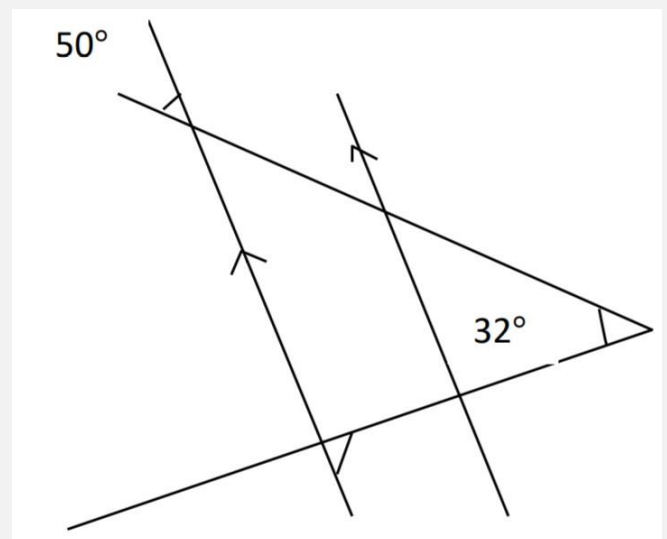
- A. $\sqrt{\frac{42w}{5d}}$
- B. $\sqrt{\frac{42w}{5d^2}}$
- C. $\sqrt{\frac{42}{5d^2}}$
- D. $\frac{1}{2}\sqrt{\frac{42w}{5}}$

30. Calculate the simple interest on ~~₦~~1,500 for 8 years at 5% per annum.

- A. ~~₦~~5,000
- B. ~~₦~~600
- C. ~~₦~~500
- D. ~~₦~~150

31. Solve the quadratic inequality $x^2 - 5x + 6 \geq 0$

- A. $x \leq 2, x \leq 7$
- B. $x \leq 3, x \geq 2$
- C. $x \leq -2, x \geq -3$
- D. $x \leq -3, x \geq 2$



32. In the diagram above $PQ \parallel RS$, The size of the angle marked x is

- A. 100°
- B. 80°
- C. 50°
- D. 30°

33. Find the gradient of a line which is perpendicular to the line with equation $3x + 2y + 1 = 1$

- A. $\frac{3}{2}$
- B. $-\frac{2}{3}$
- C. $-\frac{2}{5}$
- D. $-\frac{3}{2}$

34. Evaluate $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos x \, dx$

- A. 0
- B. 1
- C. 2
- D. 3

35. If the lines $3y = 4x - 1$ and $qy = x + 3$ are parallel to each other, the value of q is _____

- A. $-\frac{4}{3}$
- B. $-\frac{5}{4}$
- C. $\frac{4}{5}$
- D. $\frac{3}{4}$

36. The volume of a hemispherical bowl is $718\frac{2}{3} \text{ cm}^3$, find its radius.

- A. 4.0 cm
- B. 5.6cm
- C. 7.0cm

D. 3.6cm

37. If $x = 124_5$, find x .

- A. 124
- B. 121
- C. 181
- D. 180

38. A baking recipe calls for 2.5kg of sugar and 4.5kg of flour. With this recipe some cakes were baked using 24.5kg of a mixture of sugar and flour. How much sugar were used?

- A. 12.25kg
- B. 6.75kg
- C. 8.75kg
- D. 15.75kg

39. Two cars x and y start at the same point and travel towards a point P which is 150km away. If the average speed of y is 60km per hour and x arrives at P 25 minutes earlier than y . What is the average speed of x ?

- A. $51\frac{3}{9}$ km per hour
- B. 72 km per hour
- C. 66 km per hour
- D. $37\frac{1}{2}$ km per hour

40. The first term of an Arithmetic Progression is 3 and the fifth term is q . Find the number of terms in the progression if the sum of the terms is 81?

- A. 12
- B. 27
- C. 9

CHECK YOUR ANSWERS

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JAMB MATHEMATICS PAST QUESTIONS (PT.9)

1. The radius of a circle is given as 5cm. Subject to an error of 0.1cm. What is the percentage error in the area of the circle?

- A. $1/25$
- B. $1/4$
- C. 4
- D. 25

2. Find the sum of the infinity of the following series:

$$3 + 2 + \frac{4}{5} + \frac{8}{9} + \frac{16}{27} + \dots$$

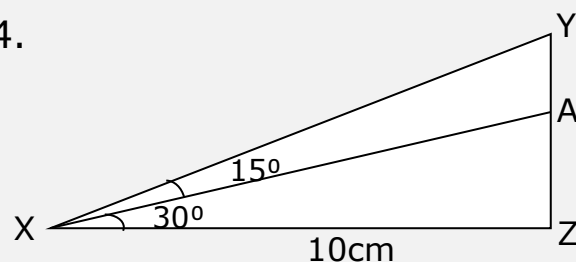
- A. 127.0
- B. 190
- C. 18
- D. 9

3. If the binary operation $*$ is defined by $m*n = mn + m + n$ for any real number m and n , find the identity element e under the operation.

- A. $e = 1$
- B. $e = -1$

- C. $e = -2$
- D. $e = 0$

4.



In the fig. above, if XZ is 10cm, calculate AY in cm.

- A. 10
- B. $10\left(1 - \frac{1}{\sqrt{3}}\right)$
- C. $10(1 - \sqrt{3})$
- D. $10\left(1 - \frac{1}{\sqrt{2}}\right)$

5. A student blows a balloon and its volume increases at a rate of $\pi(20 - t^2)\text{cm}^3 \text{S}^{-1}$ after t seconds. If the initial volume is 0cm^3 , find the volume of the balloon after 2 seconds.

- A. 37.00π
- B. 37.33π
- C. 40.00π
- D. 42.67π

6.

No. of children	0	1	2	3	4	5	6
No. of families	7	11	6	7	7	5	3

Find the mode and median respectively of the distribution above.

- A. 2, 1
- B. 1, 2
- C. 1, 5
- D. 5, 2

7. A student has five courses to take from Mathematics and Physics. There are 4 courses in Mathematics and 3 in Physics which he can choose from at will. In how many ways can he choose his course such that he takes exactly two courses in Physics?

- A. 11
- B. 12
- C. 10
- D. 7

8. Simplify $\frac{1}{\sqrt{3}-2} - \frac{1}{\sqrt{3}+2}$

A. 4

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

C. 0

D. -4

9. Evaluate $\left(\frac{x+1}{x+1}\right)^2 - \left(\frac{x-1}{x-1}\right)^2$

A. $4x^2$

B. $\left(\frac{2}{x+2}\right)^2$

C. 4

D. $4(1+x)$

10. If x is negative, what is the range of value of x within which $\frac{x+1}{3} > \frac{1}{x-3}$

A. $3 < x < 4$

B. $-4 < x < -3$

C. $-2 < x < -1$

D. $-3 < x < 0$

11. A regular polygon has 150° as the size of each interior angle. How many sides has the polygon?

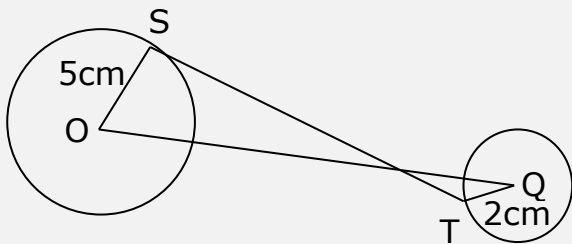
A. 12

B. 10

C. 9

D. 8

12.



In the figure above, the line segment ST is tangent to the two circles at S and T. O and Q are the centres of the circles with $OS = 5\text{cm}$, $QT = 2\text{cm}$ and $OQ = 14\text{cm}$. Find ST.

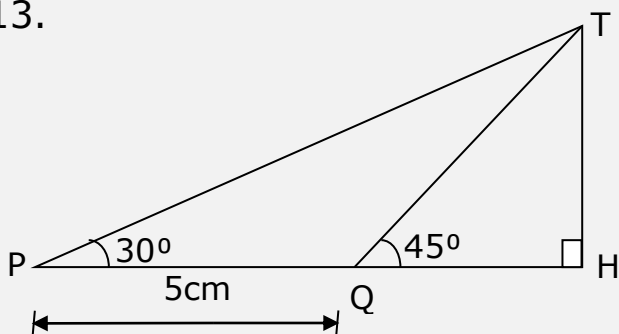
A. $\sqrt{73}\text{cm}$

B. 12cm

C. $\sqrt{87}\text{cm}$

D. 7cm

13.



From the figure above, calculate TH in centimetres.

A. $\frac{5}{\sqrt{3}+1}$

B. $\frac{5}{\sqrt{3}-1}$

C. $\frac{5}{\sqrt{3}}$

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

14. Calculate the standard deviation of the following data: 7, 8, 9, 10, 11, 12, 13.

A. 2

B. 4

C. 10

D. 11

15. Simplify $\sqrt{48} - \frac{9}{\sqrt{3}} + \sqrt{75}$

A. $5\sqrt{3}$

B. $6\sqrt{3}$

C. $8\sqrt{3}$

D. $18\sqrt{3}$

16. Find the value of p and q such that $(x - 1)$ and $(x - 3)$ are factors of $px^3 + qx^2 + 11x^6$

A. -1, -6

B. 1, -6

C. 1, 6

D. 6, -1

17. Solve for x and y

$$\begin{pmatrix} 1 & 1 \\ 3 & y \end{pmatrix} \begin{pmatrix} x \\ 1 \end{pmatrix} = \begin{pmatrix} 4 \\ 1 \end{pmatrix}$$

A. $x = -3, y = 8$

B. $x = 8, y = 3$

C. $x = 3, y = -8$

D. $x = 8, y = -3$

18. Calculate the perimeter, in cm, of a sector of a circle of radius 8cm and angle 45°

A. 2π

B. $8 + 2\pi$

C. $16 + 2\pi$

D. $16 + 16\pi$

19. The angle of depression of a boat from the top of a cliff 10m high is 30° . How far is the boat from the foot of the cliff?

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

B. $5\sqrt{3}m$

C. $10\sqrt{3}m$

D. $\frac{10\sqrt{3}}{3}m$

20. Find the point (x, y) on the Euclidean plane where the curve $y = 2x^2 - 2x + 3$ has 2 as gradient.

A. (1, 3)

B. (2, 7)

C. (0, 3)

D. (3, 15)

21. Integrate $\frac{1-x}{x^3}$ with respect to x.

A. $\frac{x-x^2}{x^4} + k$

B. $\frac{4}{x^4} - \frac{3}{x^3} + k$

C. $\frac{1}{x} - \frac{1}{2x^2} + k$

D. $\frac{1}{3x^2} - \frac{1}{2x} + k$

22.

Class Interval	1-5	6-10	11-15	16-20	21-25
Frequency	6	15	20	7	2

Estimate the median of the frequency distribution above.

- A. $10\frac{1}{2}$
- B. $11\frac{1}{2}$
- C. $12\frac{1}{2}$
- D. 13

23. The length of a notebook 15cm, was measured as 16.8cm. Calculate the percentage error to 2 significant figures.

- A. 12.00%
- B. 11.00%
- C. 10.71%
- D. 0.12%

24. Find the positive value of p if the expression $2x^2 - px + p$ leaves a remainder 6 when divided by $x - p$.

- A. 1
- B. 2
- C. 3
- D. 4

25. The 4th term of an A.P is 13 while the 10th term is 31. Find the 21st term.

- A. 175
- B. 95
- C. 64
- D. 45

26. Find the value of k if

$$\begin{vmatrix} -2 & 1 & 1 \\ 2 & 1 & k \\ 1 & 2 & -1 \end{vmatrix} = 23$$

- A. 1
- B. 2
- C. 3
- D. $\frac{16}{5}$

27. If x varies directly as y^3 and $x=2$ when $y= 1$, find x when $y=0$.

- A. 2
- B. 10
- C. 125
- D. 250

28. The ages of Tosan and Isa differ by 6 and the product of their ages is 87. Write their ages in the form (x, y) , where $x>y$.

- A. (12, 6)
- B. (23, 17)

C. (17, 11)

D. (18, 12)

29. At what point does the straight line $y = 2x + 1$ intersect the curve $y = 2x^2 + 5x - 1$?

A. (-2, -3) and $(\frac{1}{2}, 2)$

B. $(-\frac{1}{2}, 0)$ and (2, 3)

C. $(\frac{1}{2}, 2)$ and (1, 3)

D. (1, 3) and (2, 5)

30. A man kept 6 black, 5 brown and 7 purple shirts in a drawer. What is the probability of his picking a purple shirt with his eyes closed?

A. $\frac{1}{7}$

B. $\frac{11}{15}$

C. $\frac{7}{18}$

D. $\frac{7}{11}$

31. At what rate would a sum of ₦100.00 deposited for 5 years raise an interest of ₦7.50?

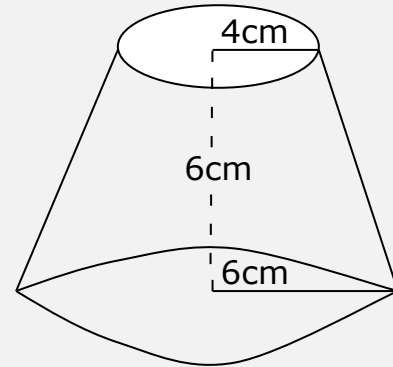
A. $1\frac{1}{2}\%$

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

C. 15%

D. 25%

32.



Find the curved surface area of the frustum in the figure above.

A. $16\pi \sqrt{10}\text{cm}^2$

B. $20\pi \sqrt{10}\text{cm}^2$

C. $24\pi \sqrt{10}\text{cm}^2$

D. $36\pi \sqrt{10}\text{cm}^2$

33. Find the length of a side of a rhombus whose diagonals are 6cm and 8cm.

A. 8cm

B. 5cm

C. 4cm

D. 3cm

34. Simplify

$$\sqrt{160r^2 + \sqrt{71r^4 + \sqrt{100^8}}}$$

- A. $9r^2$
- B. $12\sqrt{3r}$
- C. $13r$
- D. $\sqrt{13r}$

35. Of the nine hundred students admitted in a University in 1979, the following was the distribution by state:

<i>Anambra</i>	<i>185</i>
<i>Imo</i>	<i>135</i>
<i>Kaduna</i>	<i>90</i>
<i>Kwara</i>	<i>110</i>
<i>Ondo</i>	<i>155</i>
<i>Oyo</i>	<i>225</i>

In a pie chart drawn to represent this distribution, the angle subtended at the centre by Anambra is _____

- A. 50°
- B. 65°
- C. 74°

D. 88°

36. If $5^{(x+2y)}=5$ and $4^{(x+3y)}=16$, find $3^{(x+y)}$

- A. 0
- B. 1
- C. 3
- D. 27

37. A trader realises $10x - x^2$ naira profit from the sale of x bags of corn. How many bags will give him the maximum profit?

- A. 4
- B. 5
- C. 6
- D. 7

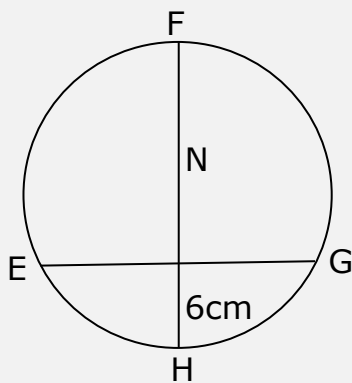
38. Find the sum of the range and the mode of the set of numbers; 10, 5, 10, 9, 8, 7, 7, 10, 8, 10, 8, 4, 6, 9, 10, 9, 10, 9, 7, 10, 6, 5.

- A. 16
- B. 14
- C. 12
- D. 10

39. If $P344_6 - 23P2_6 = 2PP2_6$. Find the value of digit P.

- A. 2
- B. 3
- C. 4
- D. 5

40.



In the diagram above, EFGH is a circle centre O. FH is a diameter and GE is a chord which meets FH at right angle at a point N. If NH = 8cm and EG = 24cm, calculate FH.

- A. 16cm
- B. 20cm
- C. 26cm
- D. 32cm

CHECK YOUR ANSWERS

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JAMB MATHEMATICS PAST QUESTIONS (PT.10)

1. A man runs a distance of 9km at a constant speed for the first 4km and then 2km/hr faster for the rest of the distance. The whole run takes him 1hr. His average speed for the first 4km is _____

- A. 6km/hr
- B. 9km/hr
- C. 8km/hr
- D. 11km/hr

2. At what rate would a sum of ₦100.00 deposited for 5 years raise an interest of ₦7.50?

- A. $2\frac{1}{2}\%$
- B. $1\frac{1}{2}\%$
- C. 15%
- D. 25%

3. Simplify $3\frac{1}{3} \times 1\frac{1}{4} \times \frac{2}{3} - 1\frac{2}{5}$

- A. $2\frac{17}{20}$
- B. $4\frac{11}{36}$
- C. $4\frac{1}{10}$

D. $3\frac{9}{10}$

4. Make t the subject of the formula in $s = ut + \frac{1}{2}at^2$

- A. $\frac{1}{a}[-u \pm \sqrt{(u^2 - 2as)}]$
- B. $\frac{1}{a}[-u \pm \sqrt{u^2 - 2as}]$
- C. $\frac{1}{a}(-u \pm \sqrt{(u^2 + 2as)})$
- D. $\frac{1}{a}(u \pm \sqrt{(u^2 + 2as)})$

5. The mean of the numbers 1, 2, 1, 0, 0, 9, 1, 4, 8, 0.8, 1, 2, and 1.1 is _____

- A. 1.5
- B. 0.8
- C. 1.05
- D. 1.02

6. What is the number whose logarithm to base 10 is 2.3482?

- A. 223.6
- B. 0.02229
- C. 0.2228
- D. 2.235

7. What factor is common to all the expressions $x^2 - x$, $2x^2 + x - 1$, and $x^2 - 1$?

- A. x
- B. $x - 1$
- C. no common factor
- D. $x + 1$

8. Find the values of P for which the equation $x^2 - (P-2)x + 2P + 1 = 0$ has equal roots.

- A. (1, 2)
- B. (21, 0)
- C. (0, 12)
- D. (4, 5)

9. If $\frac{(a^2b^{-3}c)^{3/4}}{a^{-1}b^4c^5} = a - pb^9c^r$. What is the value of $P+2q$

- A. $\frac{5}{2}$
- B. $-\frac{25}{4}$
- C. -10
- D. $-\frac{5}{4}$

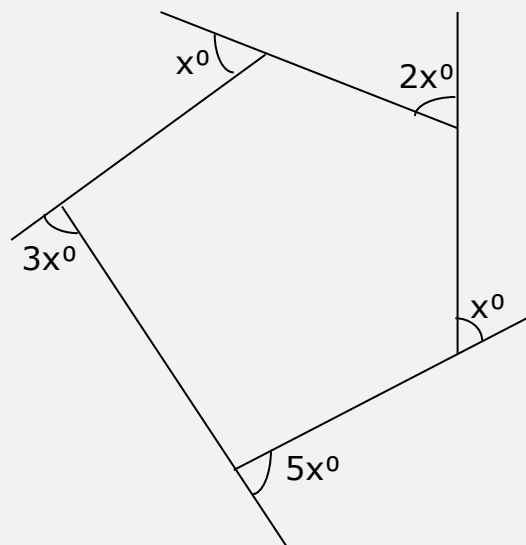
10. If sine x equals cosine x , what is x in radian?

- A. $\frac{x}{4}$
- B. $\frac{x}{2}$
- C. $\frac{x}{3}$
- D. $\frac{x}{12}$

11. Solve the equation $m^2 + n^2 = 29$, $m + n = 7$

- A. (5,3) and (3,5)
- B. (2,5) and (5,2)
- C. (5,2) and (5,3)
- D. (2,3) and (3,5)

12.



The angles marked in the figure above are measured in degrees. Find X .

- A. 20°
- B. 36°
- C. 15°

D. 30°

13. If $a:b=5:8$, $x:y=25:16$,
evaluate $\frac{a}{x}:\frac{b}{y}$

A. 2:5

B. 125:128

C. 3:5

D. 3:4

14. Convert 28_{10} to another
number in base three.

A. 1100_3

B. 1001_3

C. 2001_3

D. 1010_3

15. Find the remainder when $x^3 - 2x^2 + 3x - 3$ is divided by $x^2 + 1$

A. $x + 3$

B. $2x - 1$

C. $x - 3$

D. $2x - 1$

16. A ladder resting on a vertical wall makes an angle whose tangent is 2.4 with the ground. If

the distance between the foot of the ladder and the wall is 50cm, what is the length of the ladder?

A. 1.2m

B. 9m

C. 1.3m

D. 1m

17. Make t the subject of the formula in $s = ut + \frac{1}{2}at^2$

A. $\frac{1}{a}[u \pm \sqrt{(u^2 + 2as)}]$

B. $\frac{1}{a}[-u \pm \sqrt{u^2 + 2as}]$

C. $\frac{1}{a}(-u \pm \sqrt{(u^2 - 2as)})$

D. $\frac{1}{a}(u \pm \sqrt{(u^2 - 2as)})$

18. The shadow of a pole $5\sqrt{3}$ cm on high is 5.5cm. find the angle of elevation of the sun.

A. 60°

B. 45°

C. 75°

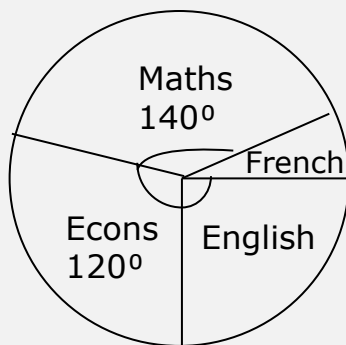
D. 50°

19. A pentagon has four of its angles equal. If the size of the

fifth angle is 60° , find the size of each of the four equal angles.

- A. 108°
- B. 120°
- C. 150°
- D. 60°

20.



The pie chart shows the distribution of courses offered by students. What percentage of the students offer English?

- A. 30%
- B. 35%
- C. 25%
- D. 20%

21. Arrange the following numbers in ascending order of magnitude $\frac{6}{7}$, $\frac{13}{15}$, 0.865

- A. $\frac{6}{7} > \frac{13}{15} > 0.865$
- B. $\frac{6}{7} > 0.865 > \frac{13}{15}$
- C. $\frac{13}{15} > 0.865 > \frac{6}{7}$
- D. $0.865 > \frac{6}{7} > \frac{13}{15}$

22. Find the value of P if the line joining $(p,4)$ and $(6,-2)$ is perpendicular to the line joining $(2,9)$ and $(-1,3)$

- A. 4
- B. 3
- C. 0
- D. 6

23. Factorize completely $y^3 - 4xy + xy^3 - 4y$

- A. $4a(a - 3b) + (3b - c)^2$
- B. $(2a + 3b - c)(2a + 3b + c)$
- C. $4a(a - 3b) + (3b + c)^2$
- D. $(2a - 3b - c)(2a - 3b + c)$

24. Evaluate $\int_{-2}^1 (x - 1)^2 dx$

- A. $-3\frac{1}{3}$
- B. 9
- C. 11

D. 7

25. Find the value of $\log_{10}(1/40)$ given that $\log_{10} 4 = 0.60217$

A. 1.6021

B. 1.3979

C. 2.3979

D. 16021

26. A bag contains 4 white balls and 6 red balls. Two balls are taken from the bag without replacement. What is the probability that they are both red?

A. $3/5$

B. $1/5$

C. $2/15$

D. $1/3$

27. If $y = (1 - 2x)^3$, find the value of $\frac{dy}{dx}$ at $x = -1$

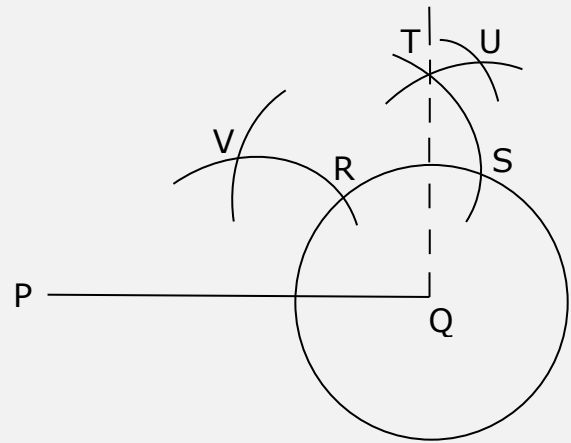
A. 27

B. -6

C. -54

D. 54

28.



What is the obtuse angle formed when the point U is joined to Q?

A. 75°

B. 105°

C. 120°

D. 125°

29. Find the sum to infinity of the series $2 + \frac{3}{2} + \frac{9}{8} + \frac{27}{32} + \dots$

A. 8

B. 1

C. 4

D. 2

30. Find the range of 4, 9, 6, 3, 2, 8, 10 and 11

A. 9

B. 11

C. 8

D. 4

31. Find the missing point 1 value in the following road.

X	-2	-1	0		1	2	3
$Y=x^3-x+3$		3	3		3	9	27

A. -9

B. -3

C. -5

D. 13

32. The n th term of a sequence is given by 3^{1-n} . Find the sum of the first three terms of the sequence.

A. $1/9$

B. $1/3$

C. 1

D. $13/9$

33. Find a positive value of p if the expression $2x^2 - px + p$ leaves a remainder 6 when divided by $x-p$.

A. 4

B. 3

C. 2

D. 1

34. If the interest of ₦150.00 for $2\frac{1}{2}$ years is ₦4.50, find the interest on ₦250.00 for 6 months at the same rate.

A. ₦1.50

B. ₦7.50

C. ₦15.00

D. ₦18.00

35. If two dice are thrown together, what is the probability of obtaining at least a score of 10.

A. $1/12$

B. $11/12$

C. $5/6$

D. $1/6$

36.

Number	1	2	3	4	5	6
Frequency	12	20	x	21	$x-1$	28

The result of tossing a fair dice 120 times is summarised above. Find the value of x .

A. 20

B. 22

C. 21

D. 19

37. At what rate would a sum of ₦100.00 deposited for 5 years raise an interest of ₦7.50?

A. 15%

B. 2½%

C. 1½%

D. 25%

38. Find the radius of a sphere whose surface area is 154cm².

A. 7.00cm

B. 3.00cm

C. 1.75cm

D. 3.50cm

39. Find the value of x for which the function $y = x^3 - x$ has a minimum value.

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

B. $\sqrt{3}$

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

D. $-\sqrt{3}$

40. Make r the subject of the formula $\frac{x}{r+a} = \frac{a}{r}$

A. $\frac{a^2}{x+a}$

B. $\frac{ax+a^2}{x}$

C. $\frac{a}{x-a}$

D. $\frac{a}{x+a}$

~~DISCLAIMER~~

These are **not** JAMB expo questions for this year, but past questions of previous years.

You are advised to study these past questions and know their **correct answers** as well as how the answer to each question was gotten to be well-prepared for your JAMB exam.

Speaking of which,

Do you want to download this JAMB Mathematics past questions & answers with **step-by-step explanation** for each correct answer?

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