1. Express 0.0000407, correct to 2 significant figures.

   A. 0.0 B. 0.00004 C. 0.000041 D. 0.000407

2. If x varies inversely as y and y varies directly as z, what is the relationship between x and y.

   A. $x \propto z$ B. $x \propto \frac{1}{z}$ C. $x \propto z^2$ D. $x \propto \frac{1}{z^2}$

3. Evaluate $\frac{3\frac{1}{4} \times 1\frac{3}{5}}{11\frac{1}{3} - 5\frac{1}{3}}$.

   A. $\frac{14}{15}$ B. $\frac{13}{15}$ C. $\frac{4}{5}$ D. $\frac{11}{15}$

4. Table 1 and Table 2 are the addition and multiplication tables respectively in modulo 5.

$\oplus$	0	1	2	3	4
0	0	1	2	3	4
1	1	2	3	4	0
2	2	3	4	0	1
3	3	4	0	1	2
4	4	0	1	2	3

Table 1

$\otimes$	0	1	2	3	4
0	0	0	0	0	0
1	0	1	2	3	4
2	0	2	4	1	3
3	0	3	1	4	2
4	0	4	3	2	1

Table 2

   Use these tables to solve the equation $(n \otimes 4) + 3 = 0 (\mathrm{mod} 5)$

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

5. The ages of Tunde and Ola are in the ratio 1: 2. If the ratio of Ola's age to Musa's age is 4 : 5, what is the ratio of Tunde's age to Musa's age?

   A. 1:4 B. 1:5 C. 2:5 D. 5:2

6. If $M = \{x : 3 \leq x \leq 8\}$ and $N = \{x : 8 < x \leq 12\}$ which of the following is true?

   I. $8 \in M \cap N$
   II. $8 \in M \cup N$
   III. $M \cap N = \phi$

   A. III only B. I and II only C. II and III only D. I, II and III

7. Given that $a = \log 7$ and $b = \log 2$, express $\log 35$ in terms of a and b.

   A. $a + b + 1$ B. $ab - 1$ C. $a - b + 1$ D. $b - a + 1$

8. If $x = \frac{2}{3}$ and $y = -6$, evaluate $xy - \frac{y}{x}$.

   A. 0 B. 5 C. 8 D. 9

9. Solve the equation $\frac{1}{5x} + \frac{1}{x} = 3$.

   A. $\frac{1}{5}$ B. $\frac{2}{5}$ C. $\frac{3}{5}$ D. $\frac{4}{5}$

10. A sum of ₦18,100.00 was shared among 5 boys and 4 girls with each boy taking ₦20.0 more than each girl. Find a boy's share.

A. ₦1,820.00 B. ₦2,000.00 C. ₦2,020.00 D. ₦2,040.00

11. One factor of $7x^2 + 33x - 10$ is

A. $7x + 5$ B. $x - 2$ C. $7x - 2$ D. $x - 5$

12. Solve $-\frac{1}{4} < \frac{3}{4}(3x - 2) < \frac{1}{2}$.

A. $\frac{5}{9} < x < \frac{8}{9}$ B. $-\frac{8}{9} < x < \frac{7}{9}$ C. $-\frac{8}{9} < x < \frac{5}{9}$ D. $-\frac{7}{9} < x < \frac{8}{9}$

13. Simplify $3x - (p - x) - (r - p)$.

A. $2x - r$ B. $2x + r$ C. $4x - r$ D. $2x - 2p - r$

14. An arc of a circle of radius 7.5cm is 7.5cm long. Find, correct to the nearest degree, the angle which the arc subtends at the centre of the circle. [Take $\pi = \frac{22}{7}$]

A. 29° B. 57° C. 65° D. 115°

15. Water flows out of a pipe at a rate of $40\pi\text{cm}^3$ per second into an empty cylindrical container of base radius 4cm. Find the height of water in the container after 4 seconds.

A. 10cm B. 14cm C. 16cm D. 20cm

16. The dimensions of a water tank are 13cm, 10cm and 70cm. If it is half-filled with water, calculate the volume of water in litres.

A. 4.55 litres B. 7.50 litres C. 8.10 litres D. 9.55 litres

17. If the total surface area of a solid hemisphere is equal to its volume, find the radius.

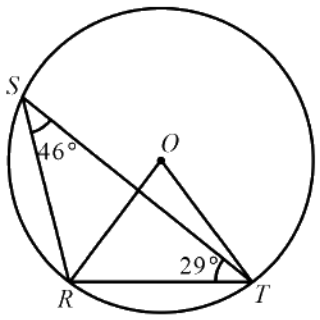
A. 3.0cm B. 4.5cm C. 5.0cm D. 9.0cm

18. Which of the following is true about parallelograms?

A. Opposite angles are supplementary B. Opposite angles are complementary

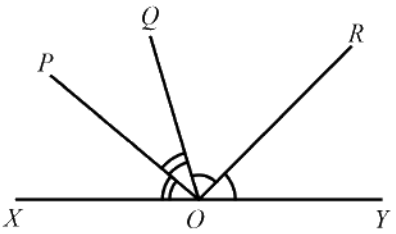
C. Opposite angles are equal D. Opposite angles are reflex angles

19. The diagram shows a circle with centre O If $\angle STR = 29°$ and $\angle RST = 46°$, calculate the value of $\angle STO$.



A. 12° B. 15° C. 29° D. 34°

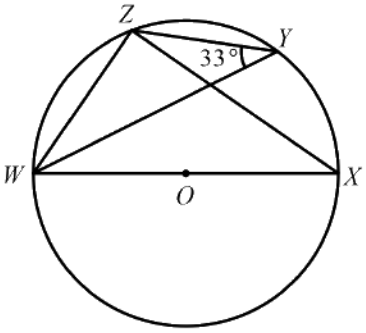
20.



In the diagram, XY is a straight line. $\angle POX = \angle POQ$ and $\angle ROY = \angle QOR$. Find the value of $\angle POQ + \angle ROY$.

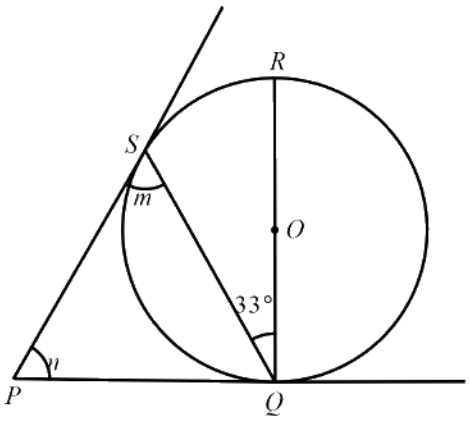
A. 60° B. 90° C. 100° D. 120°

21. The diagram shows a circle with centre O If $\angle ZYW = 33^\circ$, find $\angle ZWX$.



A. 33° B. 57° C. 90° D. 100°

22. In the diagram, PQ and PS are tangents to the circle centre O. If $\angle PSQ = m$ $\angle SPQ = n$ and $\angle SQR = 33^\circ$, find the value of $(m + n)$.



A. 103° B. 123° C. 133° D. 143°

23. Calculate the gradient (slope) of the line joining points $(-1, 1)$ and $(2, -2)$.

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

24. If $P(2, 3)$ and $Q(2, -2)$ are points on graph, calculate the length PQ.

A. 6 units B. 5 units C. 4 units D. 2 units

25. A bearing of 320° expressed as a compass bearing is

A. N50°W B. N40°W C. N50°E D. N40°E

26. Given that $\cos 30^\circ = \sin 60^\circ = \frac{\sqrt{3}}{2}$ and $\sin 30^\circ = \cos 60^\circ = \frac{1}{2}$, evaluate $\frac{\tan 60^\circ - 1}{1 - \tan 30^\circ}$.

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

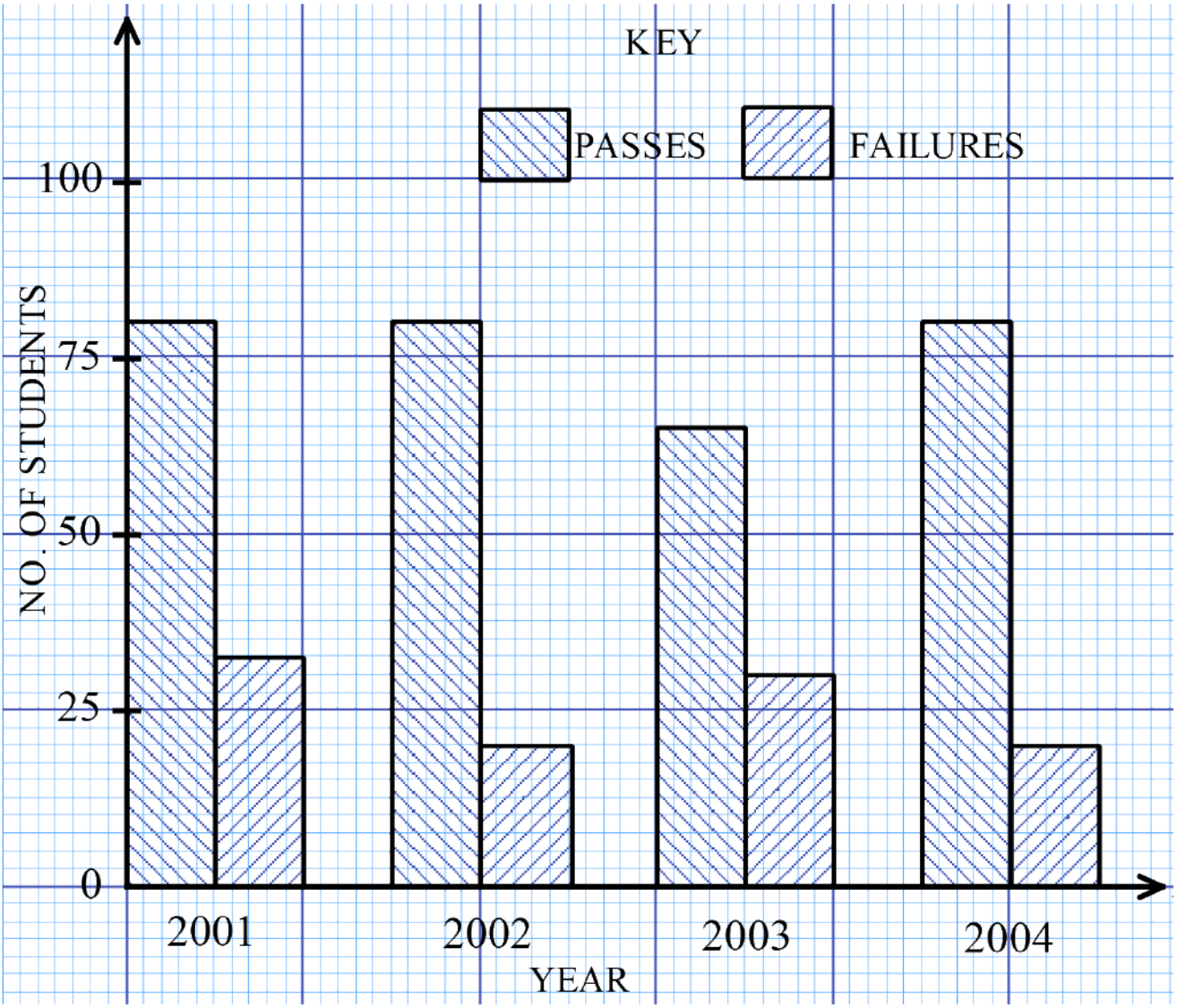
27. A stationary boat is observed from a height of 100m. If the horizontal distance between the observer and the boat is 80m, calculate correct to two decimal places, the angle of depression of the boat from the point of observation.

A. 36.87° B. 39.70° C. 51.34° D. 53.13°

28. The average age of a group of 25 girls is 10 years. If one girl, aged 12 years and 4 months joins the group, find, correct to one decimal place, the new average age of the group.

A. 10.1 years B. 9.3 years C. 8.7 years D. 8.3 years

29. The bar chart shows the statistics of the number of passes and failures in an examination in a school from 2001 to 2004. What is the ratio of the total number of passes to the total number of failures?



A. 60: 13 B. 10: 3 C. 5: 1 D. 40: 13

The table gives the distribution of marks obtained by a number of pupils in a class test.

Marks	0	1	2	3	4	5
Frequency	7	4	18	12	8	11

*Use this information to answer questions **30** and **31**.*

30. Find the median of the distribution.

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

31. Find the first quartile.

A. 1.0 B. 1.5 C. 2.0 D. 2.5

32. In a class of 45 students, 28 offer Chemistry and 25 offers Biology. If each student offers at least one of the two subjects, calculate the probability that a student selected at random from the class offers Chemistry only.

A. $\frac{2}{9}$ B. $\frac{4}{9}$ C. $\frac{3}{9}$ D. $\frac{7}{9}$

33. In what number base was the addition $1 + nn = 100$, where $n > 0$, done?

A. $n - 1$ B. n C. $n + 1$ D. $n + 1$

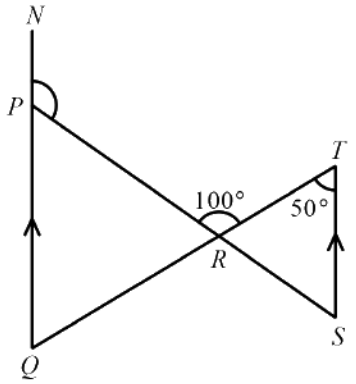
34. Simplify $\sqrt{2}(\sqrt{6} + 2\sqrt{2}) - 2\sqrt{3}$.

A. 4 B. $\sqrt{3} + 4$ C. $4\sqrt{2}$ D. $4\sqrt{3} + 4$

35. Three exterior angles of a polygon are 30° 40° and 60°. If the remaining exterior angles are 46° each, name the polygon.

A. Decagon B. Nonagon C. Octagon D. Hexagon

36. In the diagram, $NQ \parallel TS, \angle RTS = 50^\circ$ and $\angle PRT = 100^\circ$. Find the value of $\angle NPR$.



A. 110° B. 130° C. 140° D. 150°

37. Simplify the expression $\frac{a^2b^4 - b^2a^4}{ab(a+b)}$.

A. $a^2 - b^2$ B. $b^2 - a^2$ C. $a^2b - ab^2$ D. $ab^2 - a^2b$

38. Find the 6^{th} term of the sequence: $\frac{2}{3} \cdot \frac{7}{15}, \frac{4}{15} \ldots\ldots\ldots$

A. $-\frac{1}{3}$ B. $-\frac{1}{5}$ C. $\frac{1}{15}$ D. $\frac{1}{5}$

39. The diagonal of a square is 60cm. Calculate its perimeter.

A. $20\sqrt{2}$ B. $40\sqrt{2}$ C. $90\sqrt{2}$ D. $120\sqrt{2}$

40. The roots of a quadratic equation are $-\frac{1}{2}$ and $\frac{2}{3}$. Find the equation.

A. $6x^2 - x + 2 = 0$ B. $6x^2 - x - 2 = 0$ C. $6x^2 + x - 2 = 0$ D. $6x^2 + x + 2 = 0$

41. Make x the subject of the relation $d = \sqrt{\frac{6}{x} - \frac{y}{2}}$.

A. $x = \frac{6}{d^2} + \frac{12}{y}$ B. $x = \frac{12}{2d^2 - y}$ C. $x = \frac{12}{y} - 2d^2$ D. $x = \frac{12}{2d^2 + y}$

42. Consider the statements:

p : It is hot.

q : It is raining.

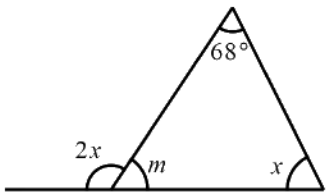
Which of the following symbols correctly represents the statement? *"It is raining if and only if it is cold"*?

A. $p \Leftrightarrow q$ B. $q \Leftrightarrow p$ C. $\sim p \Leftrightarrow \sim q$ D. $q \Leftrightarrow \sim p$

43. Given that $t = 2^{-x}$, find 2^{x+1} in terms of t.

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

44.



Find the value of m in the diagram.

A. 72° B. 68° C. 44° D. 34°

45. Two bottles are drawn with replacement from a crate containing 8 Coke, 12 Fanta and 4 Sprite bottles. What is the probability that the first is Coke and the second is not Coke?

A. $\frac{1}{12}$ B. $\frac{1}{6}$ C. $\frac{2}{9}$ D. $\frac{3}{8}$

46. If the simple interest on a certain amount of money saved in a bank for 5 years at $2\frac{1}{2}\%$ per annum is ₦500.00, calculate the total amount due after 6 years at the same rate.

A. ₦2,500.00 B. ₦2,600.00 C. ₦4,500.00 D. ₦4,600.00

47. Calculate the variance of 2,3,3,4,5,5,5 7,7 and 9.

A. 2.2 B. 3.4 C. 4.0 D. 4.2

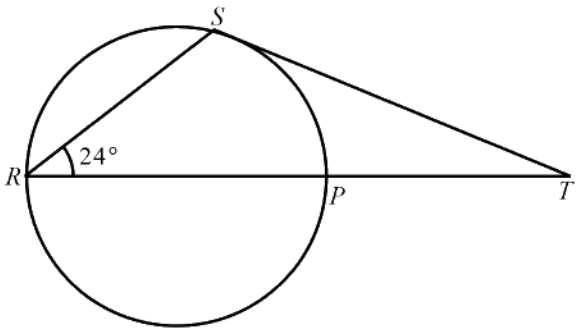
48. A circular pond of radius 4 m has a path of width 2.5m round it. Find, correct to 2 decimal places, the area of the path. [Take $\pi = \frac{22}{7}$]

A. 7.83m^2 B. 32.29m^2 C. 50.29m^2 D. 82.50m^2

49. The graph (see Figure 1) of $y = ax^2 + bx + c$ is shown in the diagram. Find the minimum value of y.

A. -2.0 B. -2.1 C. -2.3 D. -2.5

50. In the diagram, RP is a diameter of the circle RSP, RP is produced to T and TS is a tangent to the circle at S. If $\angle PRS = 24°$, calculate the value of $< STR$.



A. $24°$ B. $42°$ C. $48°$ D. $66°$

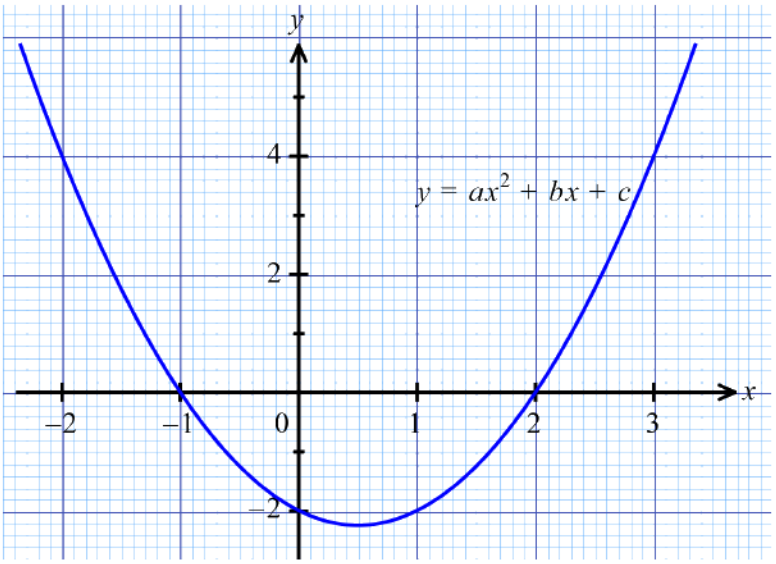


Figure 1: Graph of $y = ax^2 + bx + c$