Problems public WAEC math 2021 1 By cheetahwaec.com

Problem 1

Correct 0.007985 to three significant figures. Possible answers: A. 0.0109;B. 0.0800;C. 0.00799;D. 0.008

Problem 2

Simplify: $(11_{two})^2$. Possible answers: A. 1001₂;B. 1101₂;C. 101₂;D. 10001₂

Problem 3

Solve: $2^{\sqrt{2x+1}} = 32$. Possible answers: A. 13;B. 24;C. 12;D. 11

Problem 4

If $\log_{10} 2 = m$ and $\log_{10} 3 = n$, find $\log_{10} 24$ in terms of m and n. Possible answers: A. 3m + n;B. m + 3n;C. 4mn;D. 3mn

Problem 5

Find the 5th term of the sequence 2, 5, 10, 17, ... Possible answers: A. 22; B. 24; C. 36; D. 26 Problem 6

If $P = \{-3 < x < 1\}$ and $Q = \{-1 < x < 3\}$, where x is an integer, find $P \cap Q$. Possible answers: A. {0}; B. {-3, -2, -1, 0, 1}; C. {-2, -1, 0}; D. {-1, 0, 1}

Problem 7

Factorize 6pq - 3rs - 3ps + 6qr. Possible answers: A. 3(r-p)(2q+s); B. 3(p+r)(2q-2q-s); C. 3(2q-s)(p+r);D. 3(r-p)(s-2q)

What number should be subtracted from the sum of $2\frac{1}{6}$ and $2\frac{7}{12}$ to give $3\frac{1}{4}$? Possible answers: A. $\frac{1}{3}$; B. $1\frac{1}{2}$; C. $1\frac{1}{6}$; D. $\frac{1}{2}$

Problem 9

Mensah is 5 years old and joyce is thrice as old as mensah. In how many years will joyce be twice as old as Mensah? Possible answers: A. 3 years; B. 10 years; C. 5 years; D. 15 years Problem 10

If $16 * 2^{(x+1)} = 4^x * 8^{(1-x)}$, find the value of x. Possible answers: A. -4; B. 4; C. 1; D. -1Problem 11

The circumference of a circular track is 9 km. A cyclist rides round it a number of times and stops after covering a distance of $302 \ km$. How far is the cyclist from the starting point? Possible answers: A. 5 km;B. 6 km;C. 7 km;D. 3 km

Problem 12

Simplify $2\sqrt{7} - \frac{14}{\sqrt{7}} + \frac{7}{\sqrt{21}}$. Possible answers: A. $\frac{\sqrt{21}}{21}$; B. $7\frac{\sqrt{21}}{21}$; C. $\frac{\sqrt{21}}{3}$; D. $3\sqrt{21}$ Problem 13

If 4x + 2y = 16 and 6x - 2y = 4, find the value of (y - x). Possible answers: A. 8;B. 2;C. 4;D. 6 Problem 14



In the diagram below, $\angle ABC$ and $\angle BCD$ are right angles, $\angle BAD = t$ and $\angle EDF = 70^{\circ}$. Find the value of t. Possible answers: A. 70° ; B. 165° ; C. 140° ; D. 110°

Problem 15

The sum of the interior angles of a regular polygon with k sides is (3k - 10) right angles. Find the size of the exterior angle? Possible answers: A. 60°; B. 40°; C. 90°; D. 120°

Problem 16

Make u the subject in $x = \frac{2u-3}{3u+2}$. Possible answers: A. $u = \frac{2x+3}{3x-2}$; B. $u = \frac{2x-3}{3x-2}$; C. $u = \frac{2x+3}{2-3x}$; D. $u = \frac{2x+3}{3x+2}$ **Problem 17**

A trader paid import duty of 38 kobo in the naira on the cost of an engine. If a total of #22,800.00was paid as import duty, calculate the cost of the engine. Possible answers: A. #60,000.00;B. #120,000.00;C. #24,000.00;D. #18,000.00

Problem 18

The height of an equilateral triangle of side is $10\sqrt{3}$ cm. Calculate its perimeter. Possible answers: A. 20 cm; B. 60 cm; C. 40 cm; D. 30 cm

Problem 19

In $\triangle LMN$, |LM| = 6cm, $\angle LNM = x$, angle L is right and $\sin x = \frac{3}{5}$. Find the area of $\triangle LMN$ Possible answers: A. 60 cm²;B. 48 cm²;C. 24 cm²;D. 30 cm²

Problem 20



Consider the statements: $\{P = \text{All students offering Literature}(L)$ also offer History(H)}, $\{Q = Q\}$ Students offering History(H) do not offer Geography(G). Which of the Venn diagram correctly illustrate the two statements? Possible answers: A. A;B. B;C. C;D. D

Problem 21

Find the quadratic equation whose roots are -2q and 5q. Possible answers: A. $3x^2+3qx-10q^2$;B. $x^2+3qx+10q^2$;C. $x^2-3qx+10q^2$;D. $x^2-3qx-10q^2$

If $\tan \theta = \frac{3}{4}$, $180^{\circ} < \theta < 270^{\circ}$, find the value of $\cos \theta$. Possible answers: A. $\frac{4}{5}$; B. $\frac{3}{5}$; C. $-\frac{4}{5}$; D. $-\frac{3}{5}$ **Problem 23**

If $\frac{2}{x-3} - \frac{3}{x-2} = \frac{p}{(x-3)(x-2)}$, find *p*. Possible answers: A. 5 - x;B. -(x+5);C. 13 - x;D. -(5x - 13)**Problem 24**

The diagonals of a rhombus are 12 cm and 5 cm. Calculate its perimeter. Possible answers: A. 26 cm;B. 24 cm;C. 17 cm;D. 34 cm

Problem 25



In the diagram, $\triangle XYZ$ is produced to T. if |XY| = |ZY| and $\angle XYT = 40^{\circ}$, find $\angle XZT$ Possible answers: A. 110°;B. 130°;C. 140°;D. 180°

Problem 26

A solid brass cube is melted and recast as a solid cone of height h and base radius r. If the height of the cube is h, find r in terms of h. Possible answers: A. r = h; B. $r = \sqrt{\frac{3h^2}{\pi}}$; C. $r = h\pi$; D.

$$r = h\sqrt{\frac{3}{h}}$$

Problem 27

Which of the following is not an exterior angle of a regular polygon? Possible answers: A. 66° ; B. 72° ; C. 24° ; D. 15°

Problem 28

From a point T, a man moves $12 \ km$ due west and then moves $12 \ km$ due south to another point Q. Calculate the bearing of T from Q. Possible answers: A. 225° ;B. 315° ;C. 45° ;D. 135° **Problem 29**



In the diagram below, O is the centre of the circle, $\angle PQR = 72^{\circ}$ and OR is parallel to PS. Find $\angle OPS$. Possible answers: A. 18°;B. 108°;C. 54°;D. 36°

Problem 30

A trapezium of parellel sides 10cm and 21cm and height 8cm is inscribed in a circle of radius 7cm. Calculate the area of the region not covered by the trapezium. [Take $\pi = \frac{22}{7}$] Possible answers: A. 84 cm²;B. 80 cm²;C. 30 cm²;D. 94 cm² **Problem 31** Find, correct to two decimal places, the mean of $1\frac{1}{2}$, $2\frac{2}{3}$, $3\frac{3}{4}$, $4\frac{4}{5}$, and $5\frac{5}{6}$. Possible answers: A. 3.71;B. 3.70;C. 3.69;D. 3.72

Problem 32

A cyclist moved at a speed of X km/h for 2 hours. He then increased his speed by 2 km/h for the next 3 hours. If the total distance covered is 36 km, calculate his initials speed. Possible answers: A. 12 km/h;B. 3 km/h;C. 4 km/h;D. 6 km/h **Problem 33**



Find the value of (x + y) Possible answers: A. 215°; $B.70^\circ$; $C.135^\circ$; $D.145^\circ$ **Problem 34**



Inthe diagram, \overline{MP} is a tangent to the circle, $\angle PNQ = 64^{\circ}$ and |RQ| = |RN|. Find the angle t. Possible answers: A. 130° ; $B.115^{\circ}$; $C.58^{\circ}$; $D.68^{\circ}$

Problem 35

 $Find the first quartile of 7, 8, 7, 9, 11, 8, 7, 9, 6 and 8. Possible answers: A.8.5; B.7.0; C.7.5; D.8.0 \end{tabular}$



Inthe diagram below, find the value of x. Possible answers : A.50°; B. 30°; C. 80°; D. 100° Problem 37

A cone has a base radius of 8 cm and height 11 cm. Calculate, correct to two decimal places, the curved surface area. Possible answers: A. 341.98 cm²;B. 276.57 cm²;C. 201.14 cm²;D. 477.71 cm² **Problem 38**

Given that $\sin x = \frac{3}{5}, 0 \le x \le 90$, evaluate $(\tan x + 2\cos x)$. Possible answers: A. $2\frac{11}{20}$; A. $\frac{11}{20}$; B. $2\frac{7}{20}$; D. $\frac{1}{20}$ **Problem 39**



In the diagram, line EC is a diameter of the circle. If $\angle ABC$ equals 158°, find $\angle ADE$. Possible answers: A. 112°;B. 90°;C. 68°;D. 22° **Problem 40**

Height(cm)	160	161	162	163	164	165
No. of players	4	6	3	7	8	9

The table shows the height of 37 players of a basketball team. Calculate, correct to one decimal place, the mean height of the players. Possible answers: A. 163.0;B. 162.0;C. 160.0;D. 165.0

Problem 41

Let \overline{XY} be a line segments with the coordinates X(-8, -12) and Y(p,q). If the midpoint of \overline{XY} is (-4, -2), find the coordinates of Y. Possible answers: A. (-6, -2); B. (0, 8); C. (4, 10); D. (0, 4)Problem 42

It's known that 500 tickets for a concert for adults and children were sold at \$4.50 and \$3.00 respectively. If the total receipts for the concert was \$1987.50, how many tickets for adults were sold? Possible answers: A. 325;B. 235;C. 175;D. 400

Problem 43

The distance d between two villages is more than 18 km but not more than 23 km. Which one of these inequalities represents the statements? Possible answers: A. $18 \le d \le 23$; B. 18 < d < 23; C. $18 \le d \le 23$;D. $18 \le d \le 23$

Problem 44



The pie chart represents the distribution of fruits on display in the shop. If there are 60 apples on display, how many oranges are there? Possible answers: A. 80;B. 270;C. 120;D. 90

Problem 45

A box contains 40 identical balls of which 10 are red and 12 are blue. A ball is selected at random from the box, what is the probability that it is neither red nor blue? Possible answers: A. $\frac{9}{20}$; B. $\frac{3}{10}$;C. $\frac{1}{4}$;D. $\frac{11}{20}$ Problem 46

A fair die is tossed twice, what is the probability to get a sum of at least 10. Possible answers: A. $\frac{5}{36}$; B. $\frac{2}{3}$; C. $\frac{5}{18}$; D. $\frac{1}{6}$

Problem 47

A man will be x + 10 years old in 8 years time. If 2 years ago he was 63 years, find the value of x. Possible answers: A. 55; B. 63; C. 57; D. 67

Problem 48

The equation of a line is given as 3x - 5y = 7. Find its gradient (slope). Possible answers: A. $\frac{5}{3}$;B. $\frac{3}{5}$;C. $-\frac{3}{5}$;D. $-\frac{5}{3}$ **Problem 49**

For what value of x is $\frac{4-2x}{x+1}$ undefined? Possible answers: A. 2;B. -1;C. 1;D. -2

Problem 50

(a) Mr Sarfo borrowed \$25,000 from Afiak financial services at 21% simple interest per annum for 3 years. He was able to pay back the loan in two years at equal yearly installments, how much did he pay each year? (b) Two consecutive numbers are such that the sum of thrice the smaller and twice the larger is 17. Find correct through three significant figures the smaller number as a percentage of the sum of the two numbers.

Problem 51

A man left town am at 10:00 AM and traveled by car to town N at an average speed of 72 km/h. He spent 2 hours for a meeting and returned through town M by bus at an average speed of 40 km/h. If the distance covered by the bus was $2 \ km$ longer than that of the car and he arrived at town M at 1:55 PM. Calculate distance from M to N in km.

Problem 52

The points X, Y and Z are located such that Y is 15 km south of X, Z is 20 km from X on a bearing of 270°. Calculate: (a) correct to two significant figures, |YZ|; (b) correct to the nearest degree, the bearing of Y from Z.

Problem 53



In the diagram, AD is a diameter of a circle with centre O. If $\angle OAB = 34^\circ$, find: A. $\angle OBA$. B. $\angle OCB$.

Problem 54

(a) A man shared his property among his children as follows:

Child's	Ann	Afia	Kojo	Nuno	Akom
name					
Percentage share	5	15	10	45	25

Represent the information on a pie chart.

(b) A box contains 5 red, 3 green and 4 blue identical beads. Calculate, correct to two decimal places, the probability that a girl takes away two red beads, one after the other, from the box.

Problem 55

A. In a class of 80 students, $\frac{3}{4}$ study Biology and $\frac{3}{5}$ study Physics. If each student studies at least one of the subjects: (i) Draw a Venn diagram to represent this information. (ii) How many students study both subjects? (iii) Find the fraction of the class that study Biology but not Physics, give the answer as a decimal number. B. Johnson and Jocatol Ltd. owned a business office with floor measuring 15 m by 8 m which was to be carpeted. The cost of carpeting was GH 890.00 per square metre. If a total of GH 216, 120.00 was spent on painting and carpeting, how much was the cost of painting?

Problem 56

A. Complete the table of values for the relation $y = 2x^2 - x - 2$ for $-4 \le x \le 4$. Write the answer as a sequence of missing values for y corresponding to the values of x from -4 to 3.



B. Using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 5 units on the y-axis, draw the graph of $y = 2x^2 - x - 2$ for $4 \le x \le 4$.

C. On the same axes, draw the graph of y = 2x + 3.

D. Use the graph to find the: (i) roots of the equation $2x^2 - 3x - 5 = 0$, represent the answers as $a \pm 0.1$, $b \pm 0.1$, write the answers as a, b, where a, b are decimal numbers; (ii) range of values of x for which $2x^2 - x - 2 < 0$, represent the answer as $a \pm 0.1 < x < b \pm 0.1$, write the answer as a, b, where a, b are decimal numbers.

Problem 57

A. In a triangle PQR, $\angle PQR = 90^{\circ}$. If its area is 216 cm² and |PQ| : |QR| is 3 : 4, find |PR|. B. The present ages of a man and his son are 47 years and 17 years respectively. In how many years would the man's age be twice that of his son?



In the diagram, $\overline{PQ//RS}$ is a trapezium with QR||PS; U and T are points on \overline{PS} such that $\overline{|PU|} = 5 \text{ cm}$, $\overline{|QU|} = 12 \text{ cm}$ and $\angle PUQ = \angle STR = 90^{\circ}$. If the area of $PQR = 20 \text{ cm}^2$, calculate, correct to the nearest whole number: A. The perimeter of the trapezium. B. The area of the trapezium.

Problem 59

A cottage is on a bearing of 200° and 110° from Dogbe's and Manu's farms respectively. Dogbe walked 5 km and Manu 3 km from the cottage to their farms. A. Find, correct to two significant figures, the distance between the two farms. B. Find, correct to the nearest degree, the bearing of Manu's farm from Dogbe's. C. A ladder 10 m long leaned against a vertical wall X m high. The distance between the wall and the foot of the ladder is 2 m longer than the height of the wall. Calculate the value of X.

Problem 60

The table shows the distribution of the number of hours per day spent in studying by 50 students.

Number of hours per	4	5	6	7	8	9	10	11
day					X			
Number of students	5	7	5	9	12	4	3	5
			6			1	1	

Calculate, correct to two decimal places: (a) the mean; (b) the standard deviation.

Problem 61



1. In the diagram, there is a circle; $|PQ| = |QS|, \angle SPR = 26^{\circ}$ and the interior angles of the triangle PQS are in the ratio of 2:3:3. Calculate: (i) $\angle PQR$; (ii) $\angle RPQ$; (iii) $\angle PRQ$. 2. The coordinates of two points P and Q in a plane are (7,3) and (5, x) respectively, where x is a real number. If |PQ| = 29 units, find, correct to two decimal places, the value of x. If there

Problem 62



are more than one answer, write them down separated by the comma.

(a) On Sam's first birthday celebration, his grandfather deposited an amount of \$1,000.00 in a bank compound at 4% interest annually. Find, correct to two decimal places, how much is in the account if Sam is 4 years old. (b) In the diagram, ABCD are points on the circle with centre O. If |AB| = |BC| and $\angle ADC = 50^{\circ}$, find $\angle BAD$.

Problem 63

On Sam's first birthday celebration, his grandfather deposited an amount of \$1,000.00 in a bank

compound at 4% interest annually. Find, correct to two decimal places, how much is in the account if Sam is 4 years old.

cheetah