WAEC Mathematics 2025 Solutions

Answers and worked solutions from the Cheetah WAEC 2025 question bank.

Question 1

Find $(101_2)^2$, expressing the answer in base 2.

Answer: D

Convert 101_2 to decimal: $1 \cdot 2^2 + 0 \cdot 2 + 1 = 5$. Then $5^2 = 25$. Converting 25 to base 2 gives 11001_2.

Question 2

If three children share ₦10.50 among themselves in the ratio $6 : 7 : 8$, how much is the largest share?

Answer: B

Total parts $= 6 + 7 + 8 = 21$. One part Math input error. Largest share Math input error.

Question 3

Express 0.000834 in standard form.

Answer: A

Move the decimal point four places to the right to get 8.34. Hence $0.000834 = 8.34 \times 10^{-4}$.

Question 4

Simplify $0.027^{-\frac{1}{3}}$.

Answer: B

$0.027 = \frac{27}{1000} = \left(\frac{3}{10}\right)^3$. Therefore $0.027^{-1/3} = \left(\frac{3}{10}\right)^{-1} = \frac{10}{3} = 3\frac{1}{3}$.

Question 5

Given that $\log_2 a = \log_8 4$, find a.

Answer: B

Let $\log_8 4 = y$. Then $8^y = 4$, so $2^{3y} = 2^2$ and $y = \frac{2}{3}$. Hence $\log_2 a = \frac{2}{3}$, so $a = 2^{\frac{2}{3}}$.

Question 6

By selling some crates of soft drinks for ₦600.00, a dealer makes a profit of 50%. How much did the dealer pay for the drinks?

Answer: A

Let the cost price be C. A 50% profit means $600 = 1.5C$. Therefore $C = \frac{600}{1.5} = 400$, so the dealer paid ₦$400.00$.

Question 7

Find the nth term U_n of the arithmetic progression $11, 4, -3, \ldots$.

Answer: C

The common difference is $d = 4 - 11 = -7$. Thus
$U_n = a + (n-1)d = 11 + (n-1)(-7) = 18 - 7n$.

Question 8

If $R = \{2, 4, 6, 7\}$ and $S = \{1, 2, 4, 8\}$, find $R \cup S$.

Answer: A

The union contains every element in either set, without repetition: $R \cup S = \{1, 2, 4, 6, 7, 8\}$.

Question 9

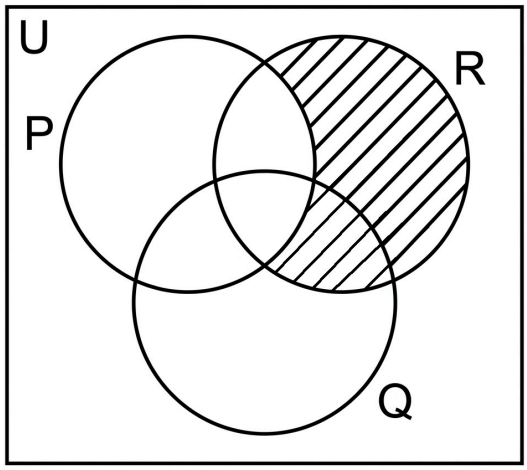
If $\frac{16}{9}, x, 1, y$ are in geometric progression, find xy.

Answer: C

The common ratio satisfies $x = \frac{16}{9}r$ and $1 = xr$. This gives $r = \frac{3}{4}$, so $x = \frac{4}{3}$ and $y = \frac{3}{4}$. Hence $xy = 1$
.

Question 10

In the diagram below, the shaded portion is



In the Venn diagram, the shaded portion is represented by which set expression?

Answer: C

The shaded part is the part of R outside P, so it is $P^1 \cap R$. The original diagram is required for independent visual verification.

Question 11

Find the values of x for which $\frac{6x-1}{x^2+4x-5}$ is undefined.

Answer: B

The expression is undefined when the denominator is zero. Factor $x^2 + 4x - 5 = (x + 5)(x - 1)$. Therefore $x = -5$ or $x = 1$.

Question 12

Solve the inequality $\frac{1}{3}(2x - 1) < 5$.

Answer: B

Multiply both sides by 3: $2x - 1 < 15$. Then $2x < 16$, so $x < 8$.

Question 13

Find the smaller value of x for which $x^2 - 3x + 2 = 0$.

Answer: D

Factor $x^2 - 3x + 2 = (x - 1)(x - 2)$. The roots are 1 and 2, so the smaller value is 1.

Question 14

Factorize $x(a - c) + y(c - a)$.

Answer: D

Since $c - a = -(a - c)$, $x(a - c) + y(c - a) = x(a - c) - y(a - c) = (a - c)(x - y)$.

Question 15

If $y \propto \frac{1}{x^2}$ and $x = 3$ when $y = 4$, find y when $x = 2$.

Answer: B

Write $y = \frac{k}{x^2}$. When $x = 3$, $4 = \frac{k}{9}$, so $k = 36$. When $x = 2$, $y = \frac{36}{4} = 9$.

Question 16

Solve $3x^2 + 25x - 18 = 0$.

Answer: B

Factor $3x^2 + 25x - 18 = (3x - 2)(x + 9)$. Hence $x = \frac{2}{3}$ or $x = -9$.

Question 17

Solve $(x + 2)(x - 7) = 0$.

Answer: D

Set each factor equal to zero: $x + 2 = 0 \Rightarrow x = -2$, and $x - 7 = 0 \Rightarrow x = 7$.

Question 18

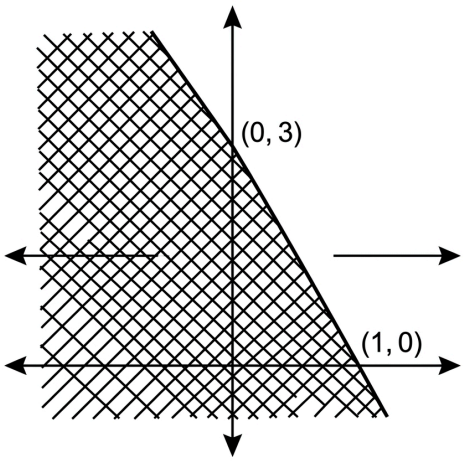
Solve $x + y = \frac{3}{2}$ and $x - y = \frac{5}{2}$. Use your result to find $2y + x$.

Answer: C

Adding the equations gives $2x = 4$, so $x = 2$. Then $2 + y = \frac{3}{2}$, so $y = -\frac{1}{2}$. Therefore $2y + x = 2\left(-\frac{1}{2}\right) + 2 = 1$.

Question 19

Which of the following could be the inequality illustrated in the sketch graph below?

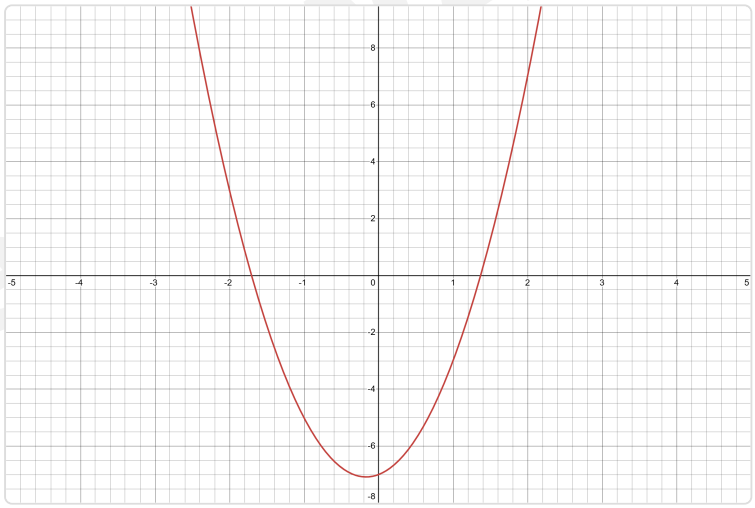


Which inequality is illustrated by the sketch graph? The boundary line passes through $(0, 3)$ and $(1, 0)$, and the region below the line is shaded.

Answer: A

The gradient is $\frac{0-3}{1-0} = -3$, so the line is $y = -3x + 3$. The shaded region is below the line, hence $y \leq -3x + 3$.

Question 20

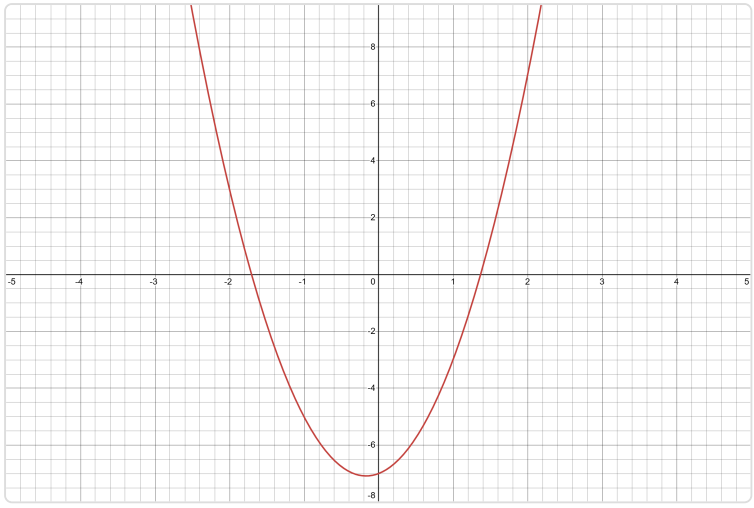


For the graph of $y = 3x^2 + x - 7$, what is the minimum value of y from the given options?

Answer: A

The exact vertex is at $x = -\frac{b}{2a} = -\frac{1}{6}$. Then $y = 3\left(-\frac{1}{6}\right)^2 - \frac{1}{6} - 7 = -\frac{85}{12} \approx -7.08$. From the graph/options, this is read as -7.

Question 21



Using the graph of $y = 3x^2 + x - 7$, find the roots of the equation.

Answer: A

The roots are where $3x^2 + x - 7 = 0$. By the quadratic formula, $x = \frac{-1 \pm \sqrt{85}}{6}$, giving approximately 1.4 and -1.7.

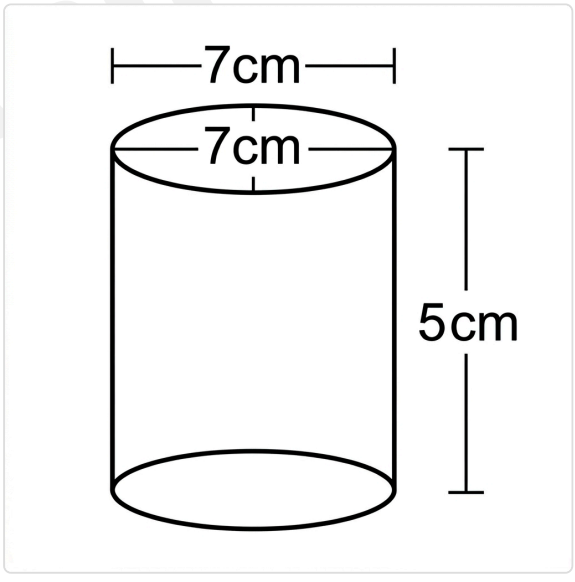
Question 22

The diagonals AC and BD of a rhombus $ABCD$ are $16\ \text{cm}$ and $12\ \text{cm}$. Calculate the area.

Answer: A

Area of a rhombus $= \frac{1}{2}d_1d_2 = \frac{1}{2}(16)(12) = 96\ \text{cm}^2$.

Question 23



A cylindrical container, closed at both ends, has radius $7\ \text{cm}$ and height $5\ \text{cm}$. Find its total surface area.

Answer: B

Total surface area of a closed cylinder is $2\pi r(r + h)$. Using $\pi = \frac{22}{7}$, $r = 7$, $h = 5$:
$2 \times \frac{22}{7} \times 7 \times 12 = 528\ \text{cm}^2$.

Question 24

Find the total surface area of a solid circular cone with base radius $3\ \text{cm}$ and slant height $4\ \text{cm}$. Take $\pi = \frac{22}{7}$.

Answer: A

Total surface area $= \pi r(r + l) = \frac{22}{7} \times 3 \times (3 + 4) = 66\ \text{cm}^2$.

Question 25

A water tank of height $\frac{1}{2}\ \text{m}$ has a square base of side $1\frac{1}{2}\ \text{m}$. It is filled from a tanker holding 1500 litres. How many litres are left?

Answer: A

Volume $= 1.5 \times 1.5 \times 0.5 = 1.125\ \text{m}^3$. Since $1\ \text{m}^3 = 1000$ litres, the tank holds 1125 litres. Water left $= 1500 - 1125 = 375$ litres.

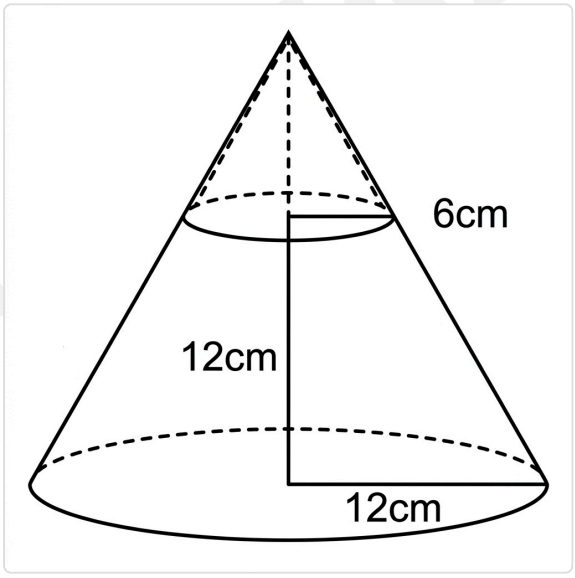
Question 26

A sphere has volume $k\ \text{cm}^3$ and surface area $k\ \text{cm}^2$. Calculate the diameter.

Answer: D

Set volume equal to surface area: $\frac{4}{3}\pi r^3 = 4\pi r^2$. Dividing by $4\pi r^2$ gives $\frac{r}{3} = 1$, so $r = 3\ \text{cm}$. Diameter $= 2r = 6\ \text{cm}$.

Question 27



A cone has a frustum with radii $12\ \text{cm}$ and $6\ \text{cm}$, and frustum slant height $12\ \text{cm}$. Calculate the full cone slant height.

Answer: A

The similar-cone radii are in the ratio $12 : 6 = 2 : 1$, so their slant heights are also in the ratio $2 : 1$. If the small slant height is s, the full slant height is $2s$, and $2s - s = 12$. Thus $s = 12$ and the full slant height is $24\ \text{cm}$.

Question 28

The positions of two countries P and Q are $(15°N, 12°E)$ and $(65°N, 12°E)$. What is the difference in latitude?

Answer: A

Both latitudes are north, so subtract: $65° - 15° = 50°$.

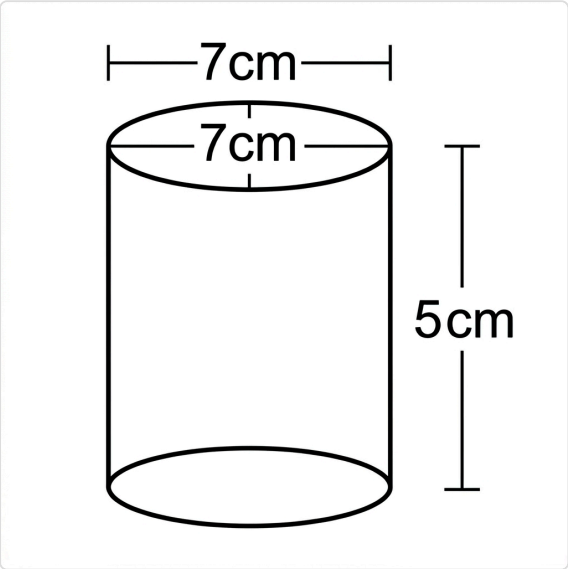
Question 29

A $120°$ sector of a circle of radius $21\ \text{cm}$ is bent to form a cone. What is the base radius of the cone?

Answer: D

The sector arc becomes the cone base circumference. Arc length $= \frac{120}{360} \times 2\pi \times 21 = 14\pi$. Since $2\pi r = 14\pi$, $r = 7\ \text{cm}$.

Question 30



A cylindrical container, closed at both ends, has radius $7\ \text{cm}$ and height $5\ \text{cm}$. What is the volume?

Answer: A

Volume $V = \pi r^2 h = \frac{22}{7} \times 7^2 \times 5 = 770\ \text{cm}^3$.

Question 31

If $\log_{10} x = \bar{2}.3675$ and $\log_{10} y = \bar{2}.9738$, find $x + y$, correct to three significant figures.

Answer: A

$\bar{2}.3675 = -2 + 0.3675$, so $x = 10^{-2+0.3675} \approx 0.02331$. Also $y = 10^{-2+0.9738} \approx 0.09414$. Therefore $x + y \approx 0.11745$, which is 0.118 to three significant figures.

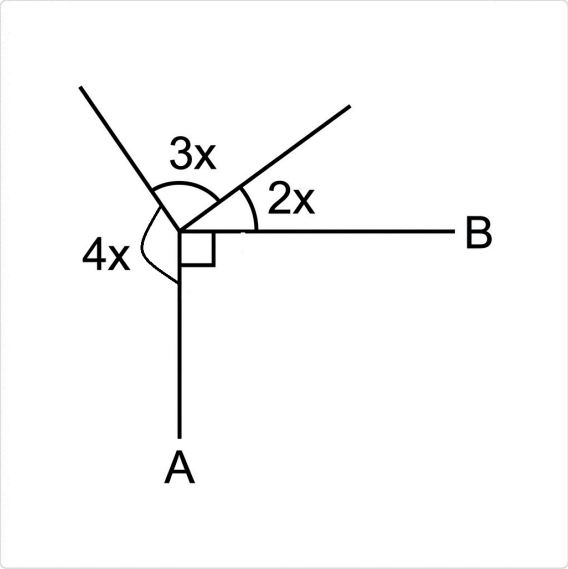
Question 32

A sector has angle $108°$ and radius $3\frac{1}{2}\ \text{cm}$. Find its perimeter.

Answer: D

Perimeter $=$ arc length $+ 2r$. Arc length $= \frac{108}{360} \times 2 \times \frac{22}{7} \times 3.5 = 6.6\ \text{cm}$. Thus perimeter $= 6.6 + 7 = 13.6 = 13\frac{3}{5}\ \text{cm}$.

Question 33

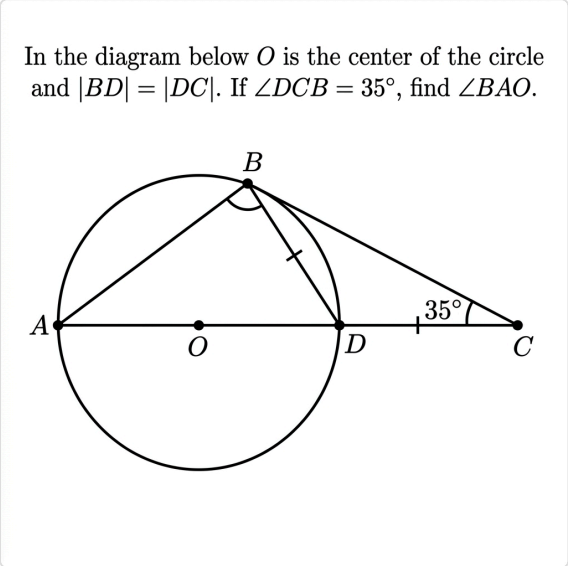


In the diagram, $AO \perp OB$. Find x.

Answer: D

The right angle contributes $90°$. The labelled angles around the point give the equation $9x + 90° = 360°$, so $x = 30°$.

Question 34



In the diagram, O is the centre of the circle and $|BD| = |DC|$. If $\angle DCB = 35°$, find $\angle BAO$.

Answer: C

Using $|BD| = |DC|$, triangle BDC is isosceles. Combining the equal angles with the circle-centre angle facts in the diagram gives $\angle BAO = 20°$.

Question 35

Which of the following angles is an exterior angle of a regular polygon?

Answer: C

An exterior angle of a regular polygon must divide $360°$ exactly. Only $72°$ works because $360 \div 72 = 5$.

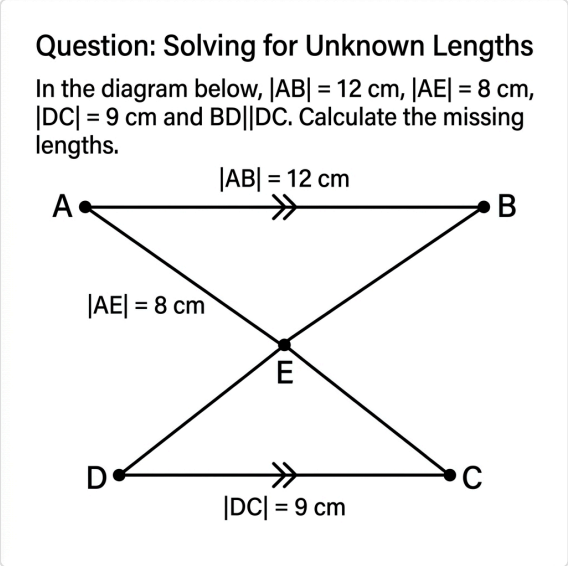
Question 36

The locus of a point equidistant from two fixed points is the:

Answer: D

All points equidistant from two fixed points lie on the perpendicular bisector of the segment joining those points.

Question 37

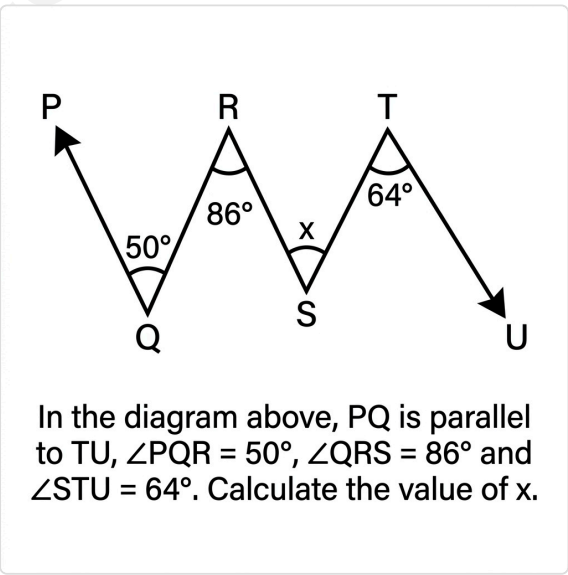


In the diagram, $|AB| = 12\ \text{cm}$, $|AE| = 8\ \text{cm}$, $|DC| = 9\ \text{cm}$, and the indicated lines are parallel. Find $|EC|$.

Answer: A

By similarity from the parallel lines, $\frac{EC}{AE} = \frac{DC}{AB} = \frac{9}{12}$. Hence $EC = 8 \times \frac{9}{12} = 6\ \text{cm}$.

Question 38



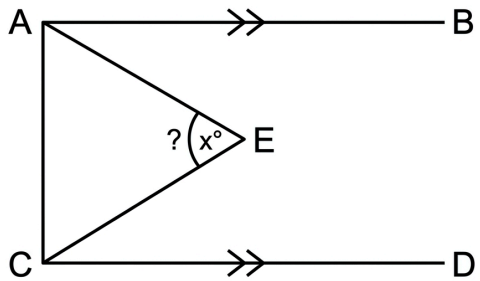
In the diagram, $PQ \parallel TU$, $\angle PQR = 50°$, $\angle QRS = 86°$, and $\angle STU = 64°$. Find x.

Answer: A

Using corresponding and co-interior angles on the parallel lines, the angle chase gives $x = 100°$.

Question 39

In the diagram below, AB||CD, the bisector of ∠BAC and ∠ACD meet at E. Find the value of ∠AEC.

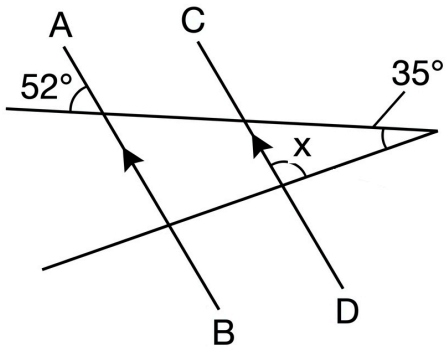


In the diagram, $AB \parallel DC$, and the bisectors of $\angle BAC$ and $\angle ACD$ meet at E. Find $\angle AEC$.

Answer: D

The two angles being bisected are supplementary because of the parallel lines. The bisectors of supplementary angles meet at a right angle, so $\angle AEC = 90°$.

Question 40



In the diagram above, AB||CD. What is the size of the angle marked x?

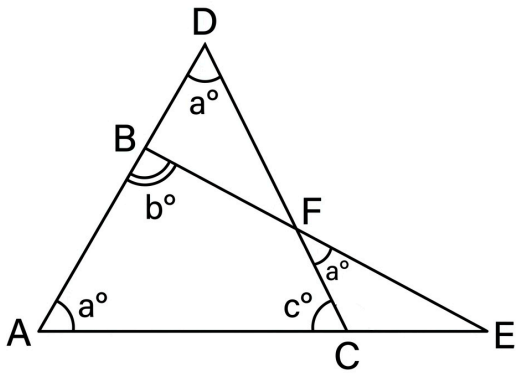
In the diagram, $AB \parallel CD$. What is the size of x?

Answer: A

Using corresponding angles and the triangle angle sum in the diagram gives $x = 93°$.

Question 41

In the diagram below, the value of angles b + c is?

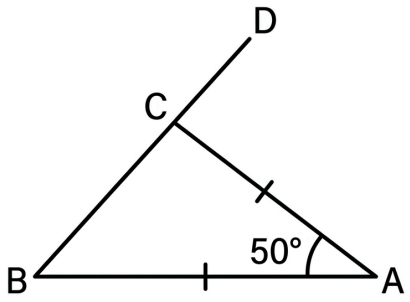


In the diagram, find $b + c$.

Answer: C

The diagram forms a cyclic quadrilateral, so the opposite angles b and c are supplementary. Therefore $b + c = 180°$.

Question 42



In Δ ABC above, BC is produced to D, |AB| = |AC| and ∠BAC = 50°. Find ∠ACD.

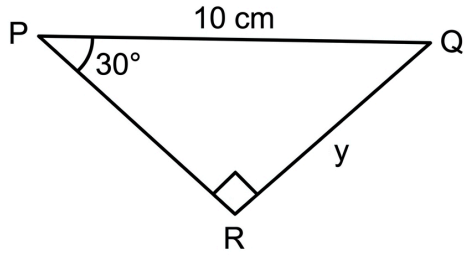
In $\triangle ABC$, side BC is produced to D. If $|AB| = |AC|$ and $\angle BAC = 50°$, find $\angle ACD$.

Answer: A

Since $|AB| = |AC|$, the base angles are equal: $\frac{180° - 50°}{2} = 65°$. The exterior angle $\angle ACD = 180° - 65° = 115°$.

Question 43

In the diagram below, ∠PRQ = 90°, ∠QPR = 30° and |PQ| = 10 cm. Find y.



In right triangle PQR, $\angle PRQ = 90°$, $\angle QPR = 30°$, and $|PQ| = 10\ \text{cm}$. Find $|QR|$.

Answer: C

PQ is the hypotenuse. The side opposite $30°$ in a right triangle is half the hypotenuse, so $QR = \frac{10}{2} = 5\ \text{cm}$.

Question 44

Find the mode of $8, 10, 9, 9, 10, 8, 11, 8, 10, 9, 8, 14$.

Answer: A

The mode is the value occurring most often. The number 8 appears four times, more than any other value.

Question 45

The bearings of Q and R from P are $030°$ and $120°$. If $|PQ| = 12\ \text{m}$ and $|PR| = 5\ \text{m}$, find $|QR|$.

Answer: B

The included angle is $120° - 30° = 90°$. Thus $QR = \sqrt{12^2 + 5^2} = 13\ \text{m}$.

Question 46

Without using tables, evaluate $\frac{\sin 20°}{\cos 70°} + \frac{\cos 25°}{\sin 65°}$.

Answer: A

Since $\sin 20° = \cos 70°$, the first fraction is 1. Since $\cos 25° = \sin 65°$, the second fraction is also 1. Sum $= 2$.

Question 47

The mean of 20 observations is 4. If the largest observation is 23, find the mean of the remaining observations.

Answer: D

Total $= 20 \times 4 = 80$. Removing 23 leaves 57 for 19 observations. New mean $= \frac{57}{19} = 3$.

Question 48

Two fair dice are tossed once. Find the probability that the sum is at least 10.

Answer: A

Favourable ordered pairs are $(4,6),(5,5),(6,4),(5,6),(6,5),(6,6)$, so there are 6 outcomes out of 36. Probability $= \frac{6}{36} = \frac{1}{6}$.

Question 49

Find the median of $2.64, 2.50, 2.72, 2.91, 2.35$.

Answer: B

In ascending order: $2.35, 2.50, 2.64, 2.72, 2.91$. The middle value is 2.64.

Question 50

A box contains 2 red, 6 white, and 5 black balls. A ball is selected at random. What is the probability that it is black?

Answer: A

There are $2+6+5=13$ balls, and 5 are black. Therefore the probability is $\frac{5}{13}$.

Question 51

PART ONE. (a) Factorize $px - 2qx - 4qy + 2py$. (b) Given $U = \{1,2,3,4,5,6,7,8,9,10\}$, $P = \{1,2,4,6,10\}$, and $Q = \{2,3,6,9\}$, show that $(P \cup Q)^1 = P^1 \cap Q^1$.

Answer: (a) $(p-2q)(x+2y)$. (b) Both sides equal $\{5,7,8\}$.

(a) Group terms: $px - 2qx - 4qy + 2py = x(p-2q) + 2y(p-2q) = (p-2q)(x+2y)$. (b) $P \cup Q = \{1,2,3,4,6,9,10\}$, so $(P \cup Q)^1 = \{5,7,8\}$. Also $P^1 = \{3,5,7,8,9\}$ and $Q^1 = \{1,4,5,7,8,10\}$, so $P^1 \cap Q^1 = \{5,7,8\}$.

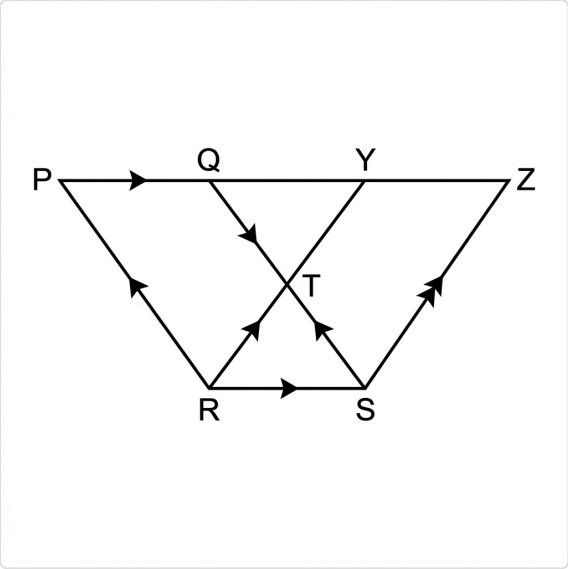
Question 52

(a) y is partly constant and partly varies inversely as the square of x. Write the relationship between x and y. (b) When $x=1$, $y=11$, and when $x=2$, $y=5$. Find y when $x=4$.

Answer: (a) $y = a + \frac{b}{x^2}$. (b) $y = \frac{7}{2}$.

(a) $y = a + \frac{b}{x^2}$, where a and b are constants. (b) From $x=1$, $a+b=11$. From $x=2$, $a+\frac{b}{4}=5$. Subtracting gives $\frac{3b}{4}=6$, so $b=8$, and $a=3$. When $x=4$, $y = 3 + \frac{8}{16} = \frac{7}{2}$.

Question 53



(a) In the diagram, $PQSR$ and $SRYZ$ are parallelograms, and $PQYZ$ is a straight line. If $|QY| = 2\ \text{cm}$ and $|RS| = 3\ \text{cm}$, find $|PZ|$. (b) Towns P and Q lie on latitude $56°N$, with longitudes $25°E$ and $95°E$. Find PQ along the parallel of latitude, correct to the nearest km. Take $R = 6400\ \text{km}$ and $\pi = \frac{22}{7}$.

Answer: (a) $8\ \text{cm}$. (b) $4374\ \text{km}$.

(a) In parallelogram $PQSR$, $PQ = RS = 3\ \text{cm}$. In parallelogram $SRYZ$, $YZ = RS = 3\ \text{cm}$. Hence $PZ = PQ + QY + YZ = 3 + 2 + 3 = 8\ \text{cm}$. (b) Difference in longitude $= 95° - 25° = 70°$. Distance $= \frac{70}{360} \times 2\pi R \cos 56° \approx 4374\ \text{km}$.

Question 54

(a) A pack of 52 cards is shuffled and one card is drawn. Find the probability that it is either a five or a red nine. (b) The bearing of Q from P is $150°$, and the bearing of R from Q is $060°$. If $|PQ| = 5\ \text{m}$ and $|QR| = 3\ \text{m}$, find the bearing of R from P, correct to the nearest degree.

Answer: (a) $\frac{3}{26}$. (b) $119°$.

(a) There are 4 fives and 2 red nines, so favourable cards $= 6$. Probability $= \frac{6}{52} = \frac{3}{26}$. (b) Components from P to Q: east $= 5\sin 150° = 2.5$, north $= 5\cos 150° = -4.330$. Components from Q to R: east $= 3\sin 60° = 2.598$, north $= 3\cos 60° = 1.5$. Thus from P to R: east $= 5.098$, north $= -2.830$. Bearing $\approx 119°$.

Question 55

The table shows marks scored by 32 students. Marks: $1, 2, 3, 4, 5, 6, 7, 8, 9, 10$. Frequencies: $2, 3, 4, 4, 4, 4, 5, 3, 2, 1$. (a)(i) Find the mean. (ii) Find the median. (iii) Find the mode. (b) Find the percentage who scored at least 8 marks.

Answer: Mean $= 5.22$, median $= 5$, mode $= 7$, percentage $= 18.75\%$.

Total frequency $= 32$. $\sum fx = 167$, so mean $= \frac{167}{32} = 5.21875 \approx 5.22$. The 16th and 17th observations are both 5, so median $= 5$. The highest frequency is 5, at mark 7, so mode $= 7$. At least 8 marks: $3 + 2 + 1 = 6$. Percentage $= \frac{6}{32} \times 100 = 18.75\%$.

Question 56

PART TWO. (a)(i) Using mathematical tables, find $2\sin 63.35°$. (ii) Find $\log(\cos 44.74°)$. (iii) Find k given that $\log k - \log(k-2) = \log 5$. (b) Use logarithm tables to evaluate $\frac{3.68^2 \times 6.705}{\sqrt{0.3581}}$.

Answer: (a)(i) 1.788 approx. (ii) -0.1486 approx. (iii) $k = \frac{5}{2}$. (b) 151.7 approx.

(a)(i) $\sin 63.35° \approx 0.8938$, so $2\sin 63.35° \approx 1.788$. (ii) $\cos 44.74° \approx 0.7103$, so $\log(\cos 44.74°) \approx -0.1486$. (iii) $\log \frac{k}{k-2} = \log 5$, so $\frac{k}{k-2} = 5$. Hence $k = 5k - 10$, $4k = 10$, and $k = \frac{5}{2}$. (b) $\frac{3.68^2 \times 6.705}{\sqrt{0.3581}} \approx 151.7$.

Question 57

(a) Given $p = x + ym^3$, find m in terms of p, x, y. (b) By completing the square, find the roots of $x^2 - 6x + 7 = 0$ to 1 decimal place. (c) The product of two consecutive positive odd numbers is 195. Form and solve a quadratic equation to find the numbers.

Answer: (a) $m = \sqrt[3]{\frac{p-x}{y}}$. (b) 1.6 and 4.4. (c) 13 and 15.

(a) $p = x + ym^3 \Rightarrow ym^3 = p - x$, so $m = \sqrt[3]{\frac{p-x}{y}}$. (b) $x^2 - 6x + 7 = 0 \Rightarrow (x-3)^2 - 2 = 0$, so $x = 3 \pm \sqrt{2} \approx 1.6, 4.4$. (c) Let the smaller odd number be n. Then $n(n+2) = 195$, so $n^2 + 2n - 195 = 0 = (n-13)(n+15)$. Hence the numbers are 13 and 15.

Question 58

(a) Complete the table for $y = 2\cos 2x - 1$ for $x = 0°, 30°, 60°, 90°, 120°, 150°, 180°$. (b) Draw the graph for $0° \le x \le 180°$. (c) On the same axes, draw $y = \frac{1}{180}(x - 360)$. (d) Use the graphs to find x for which $2\cos 2x + \frac{1}{2} = 0$.

Answer: Table: $1, 0, -2, -3, -2, 0, 1$. Intersections: $x \approx 52.2°$ and $127.8°$.

Substitution gives $y = 1, 0, -2, -3, -2, 0, 1$. For part (d), solve $2\cos 2x + \frac{1}{2} = 0$, so $\cos 2x = -\frac{1}{4}$. In $0° \le x \le 180°$, $2x \approx 104.48°$ or $255.52°$. Therefore $x \approx 52.2°$ or $127.8°$.

Question 59

(a) Using ruler and compasses only, construct $\triangle ABC$ with $|AB| = 7.5\text{ cm}$, $|BC| = 8.1\text{ cm}$, and $\angle ABC = 105°$. (b) Locate D on BC such that $|BD| : |DC| = 3:2$. (c) Through D, construct a line perpendicular to BC. (d) If the line meets AC at P, measure $|BP|$.

Answer: $|BP| \approx 5.4\text{ cm}$.

Draw $BC = 8.1\text{ cm}$. At B, construct $105°$, mark A on the ray with $AB = 7.5\text{ cm}$, and join A to C. Divide BC in the ratio $3:2$: $BD = \frac{3}{5} \times 8.1 = 4.86\text{ cm}$. Draw the perpendicular to BC through D, meeting AC at P. Measurement gives $|BP| \approx 5.4\text{ cm}$.

Question 60

(a)(i) A man travels from X on bearing $060°$ to Y, $20\ \text{km}$ away. From Y, he travels to Z on bearing $195°$. If Z is directly east of X, find YZ to 3 s.f. (ii) Find ZX to 3 s.f. (b)(i) An aircraft flies due south from latitude $36°N$ to $36°S$ on the same longitude. Find the distance travelled to 3 s.f. (ii) If its speed is $800\ \text{km/h}$, find the time to the nearest hour. Take $\pi = \frac{22}{7}$, $R = 6400\ \text{km}$.

Answer: (a)(i) $YZ = 10.4\ \text{km}$. (ii) $ZX = 14.6\ \text{km}$. (b)(i) $8.05 \times 10^3\ \text{km}$. (ii) 10 hours.

(a) From X to Y: north component $= 20\cos 60° = 10$, east component $= 20\sin 60° = 17.32$. Since Z is directly east of X, $10 + YZ\cos 195° = 0$, so $YZ = \frac{-10}{\cos 195°} \approx 10.4\ \text{km}$. Easting of Z is $17.32 + 10.35\sin 195° \approx 14.6\ \text{km}$, so $ZX \approx 14.6\ \text{km}$. (b) Latitude difference $= 72°$. Distance $= \frac{72}{360} \times 2 \times \frac{22}{7} \times 6400 \approx 8045.7\ \text{km} = 8.05 \times 10^3\ \text{km}$. Time $= 8045.7/800 \approx 10$ hours.

Question 61

The table shows scores of 2000 candidates. Percentage marks: $11-20, 21-30, 31-40, 41-50, 51-60, 61-70, 71-80, 81-90$. Frequencies: $68, 184, 294, 402, 480, 310, 164, 98$. Prepare a cumulative frequency table and draw the cumulative frequency curve.

Answer: Cumulative frequencies: $68, 252, 546, 948, 1428, 1738, 1902, 2000$.

Add the frequencies successively. The cumulative frequencies are $68, 252, 546, 948, 1428, 1738, 1902, 2000$. For the ogive, plot cumulative frequency against the upper class boundaries $20.5, 30.5, 40.5, 50.5, 60.5, 70.5, 80.5, 90.5$, starting at $(10.5, 0)$, then join the points smoothly.
