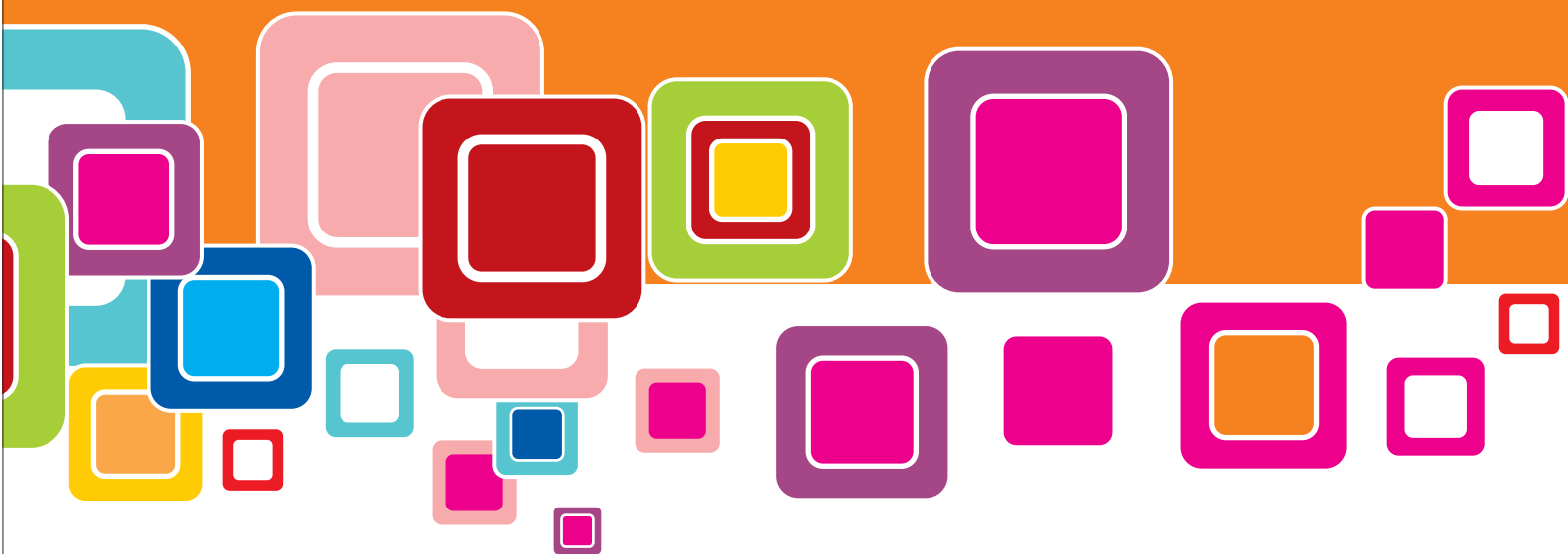




Math Olympiad



Grade IX - X

Q.1 The volume of a cylinder is given by the formula $V = \pi r^2 h$, where h is the height of the cylinder and r is the radius. Make 'r' the subject of the formula.

a) $r = \sqrt[3]{\frac{V}{\pi h}}$ b) $r = \sqrt{V\pi h}$ c) $r = \sqrt{\frac{\pi h}{V}}$ d) $r = \sqrt{\frac{V}{\pi h}}$

Q.2 A cylinder of height 75 cm has a volume of 6000 cm³. Find its radius correct to 3 s.f. using formula $V = \pi r^2 h$

a) $r \approx 5.05$ cm b) $r \approx 5.08$ cm c) $r \approx 5.03$ cm d) none of these

Q.3 Make 'r' the subject of the formula. $A = \pi r \sqrt{s^2 + t^2}$

a) $r = \frac{A}{\pi \sqrt{s^2 + t^2}}$ b) $r = \frac{\pi r \sqrt{s^2 + t^2}}{A}$ c) $r = \sqrt{\frac{A}{\pi r(s^2 + t^2)}}$ d) none of these

Q.4 Make 'u' the subject of the formula $v^2 = u^2 + 2as$

a) $u = \sqrt{v^2 + 2as}$ b) $u = \sqrt{v^2 - 2as}$

c) $u = v^2 - 2as$ d) $u = v^2 + 2as$

Q.5 The formula for volume V of a sphere is given as $V = \frac{4}{3} \pi r^3$. Find 'V' if r is 5 cm. [$\pi = \frac{22}{7}$]

a) $V \approx 520$ cm³ b) $V \approx 530$ cm³

c) $V \approx 500$ cm³ d) $V \approx 523.8$ cm³

Q.6 The cost \$e of printing 'm' newspapers is given by the formula " $e = 1.50 + 0.05 m$ ". How many newspapers can be printed for \$25?

a) 450 newspapers b) 460 newspapers

c) 470 newspapers d) 480 newspapers

Q.7 Make 'a' the subject of the formula $\sqrt{a+2} = \frac{b-3}{\sqrt{a-2}}$

a) $a = \sqrt{(b-3)^2 + 4}$ b) $a = \sqrt{(b+3)^2 + 4}$

c) $a = \sqrt{(b-3)^3 - 4}$ d) $a = \sqrt{(b-3)^2 - 4}$

Q.8 Solve $\left(-\frac{1}{4}\right)^2 \times (-40) \times (12)$

a) 30 b) 20 c) 10 d) -30

Q.9 The acceleration a of a train is found using the formula $a = \frac{v^2 - u^2}{2s}$. Find a when $v = 20 \text{ m/s}$ and $u = 10 \text{ m/s}$ and $s = 2.5 \text{ m}$.

- a) $a = 30 \text{ m/s}^2$ b) $a = 40 \text{ m/s}^2$
c) $a = 50 \text{ m/s}^2$ d) $a = 60 \text{ m/s}^2$

Q.10 If $x = -3$, $y = -1$ and $k = 0$. The value of $5k + x - 3y$ is:

- a) 0 b) 1 c) 2 d) 3

Q.11 If $k = -3$, $m = 2$, $n = 4$ then value of the expression $m^3 + k^2 + n^2 + n$ is:

- a) 30 b) 37 c) 34 d) 36

Q.12 Expand $(3a + 5)^2$

- a) $3a^2 + 10a + 25$ b) $4a^2 + 12a + 25$
c) $9a^2 + 30a + 25$ d) none of these

Q.13 Simplify $(a + 5b)^2 - (5a - b)^2$

- a) $-20a^2 + 20ab + 4b^2$ b) $-24a^2 + 20ab + 24b^2$
c) $-24a^2 + 30ab + 24b^2$ d) none of these

Q.14 Expand and simplify $(x + 1)(x + 3)(x + 5)$

- a) $x^3 + 6x^2 + 20x + 15$ b) $x^3 + 9x^2 + 23x + 5$
c) $x^3 + 9x^2 + 23x + 15$ d) none of these

Q.15 Expand and simplify $(2x - 1)(x + 1)(x - 1)$

- a) $2x^3 - x^2 - 2x + 1$ b) $2x^3 - 2x^2 - 2x - 1$
c) $2x^3 - x^2 - 2x - 1$ d) none of these

Q.16 $(x - 1)^3 = \underline{\hspace{2cm}}$.

- a) $x^3 + 3x^2 + 3x + 1$ b) $x^3 + 3x^2 + 2x + 1$
c) $x^3 - 3x^2 + 3x - 1$ d) none of these

Q.17 Simplify $3(x - y) + 4(x + 2y)$

- a) $7x + 5y$ b) $5x + 7y$
c) $17x + 50y$ d) $x + 2y$

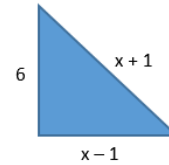
Q.18 Simplify $7b(a + 2) - a(3b + 3)$

- a) $-3a + 14b + 4ab$ b) $13a - 4b + ab$
c) $-5a + 4b + 14ab$ d) none of these

- Q.31** Solve the equation $4(y + 1) = \frac{3}{1-y}$
- a) $-\frac{1}{2}$ b) $-\frac{1}{3}$ c) $\pm\frac{1}{2}$ d) none of the above

Q.32 Find the perimeter of the triangle

- a) $x + 6$ b) $2x + 6$
 c) $2x + 7$ d) None of the above



Q.33 A diver is below the surface of the water at $-20m$. He dives down by $3m$, then rises by $5m$. Where is he now?

- a) $18m$ b) $-20m$ c) $-18m$ d) none of these

Q.34 If the perimeter of an isosceles triangle is 22 cm, the length of the base is 8 cm. Find the other two lengths of the same sides.

- a) 5 cm b) 6 cm c) 7 cm d) 8 cm

Q.35 The sum of four consecutive numbers is 90 . Find the numbers

- a) $19, 20, 21, 22$ b) $20, 21, 22, 23$
 c) $21, 22, 23, 24$ d) none of these

Q.36 The denominator of a fraction is 2 more than the numerator. If both denominator and numerator is increased by 1 the fraction becomes $\frac{2}{3}$. Find the original fraction.

- a) $\frac{1}{3}$ b) $\frac{3}{5}$ c) $\frac{2}{3}$ d) none of these

Q.37 Factorise the following expression completely. $9x + x^2$

- a) $x(9 + x)$ b) $10x^2$ c) $10x + x^2$ d) None of these

Q.38 Factorise the following expression completely

$$6a^2 + 4ab + 2ac$$

- a) $a(6a + 4b + 2c)$ b) $2a(3a + 2b + c)$
 c) $3a(2a + 2b + c)$ d) None of these

Q.39 Factorise the following expression completely $2ax - 2ay - bx + by$

- a) $(2a + b)(x - y)$ b) $(2a - b)(x + y)$
 c) $(2a - b)(x - y)$ d) None of these

Q.40 Factorize the following expression completely $x^2a + x^2b + ya + yb$

- a) $(x^2 + y)(a + b)$ b) $(x^2 + y)(a - b)$
 c) $(x^2 - y)(a + b)$ d) None of these

Q.41 Factorize $y^2 + 10y + 25$

- a) $(y+5)(y+5)$ b) $(y+2)(y+5)$
c) $(y+1)(y+15)$ d) $(2y+1)(y+4)$

Q.42 Factorization means breaking an expression into:

- a) Smaller parts b) Bigger parts
c) Complex parts d) none of these

Q.43 24 as a product of prime factors is written as:

- a) 8×3 b) 4×6 c) $2^3 \times 3$ d) 2×12

Q.44 $y^2 + 2y - 15 =$ _____.

- a) $(y + 3)(y - 5)$ b) $(y - 3)(y + 5)$
c) $(y - 3)(y - 5)$ d) $(y + 3)(y + 3)$

Q.45 $b^2 - 6b + 8 =$ _____.

- a) $(b - 2)(b - 4)$ b) $(b + 2)(b + 4)$
c) $(b - 14)(b - 12)$ d) $(2b + 2)(b - 4)$

Q.46 The simplification of $x^3 - x =$

- a) $x(x + 1)(x + 1)$ b) $x(x - 1)(x - 1)$
c) $x(x - 1)(x + 1)$ d) $(1 - x)(x - 1)$

Q.47 The simplification of $1 - \frac{x^2}{4} =$

- a) $\left(\frac{2+x}{2}\right)\left(\frac{2-x}{2}\right)$ b) $\left(\frac{2+x}{2}\right)\left(\frac{2+x}{2}\right)$
c) $\left(\frac{x-2}{2}\right)\left(\frac{x+2}{2}\right)$ d) $\left(\frac{x-2}{2}\right)\left(\frac{x-2}{2}\right)$

Q.48 Solve the equation $z^2 - 8z = 65$

- a) $z = \{5, -13\}$ b) $z = \{-5, 13\}$
c) $z = \{-3, 15\}$ d) none of these

Q.49 Simplify as far as possible. $\frac{(2x)^2 - 8x}{4x}$

- a) $\frac{x^2 - 8x}{4x}$ b) $x - 2$ c) $\frac{x(x-8)}{4x}$ d) None of these

Q.50 Simplify as far as possible. $\frac{x^2 - 4x - 21}{x^2 - 5x - 14}$

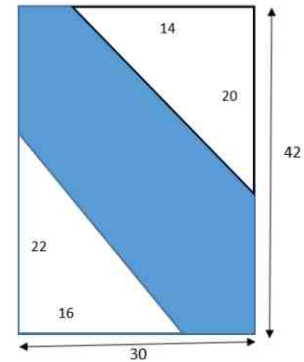
- a) $\frac{x^2 - 4x - 21}{x^2 - 5x - 14}$ b) $\frac{(x+3)}{(x+2)}$ c) $\frac{(x-7)(x-3)}{(x-7)(x+2)}$ d) None of these

- Q.51** To buy a car Mohsin borrowed \$25000 for thirty six months and paid \$4500 simple interest on the loan. What rate of simple interest per annum did he pay?
- a) 3 % b) 4 % c) 5 % d) 6 %
- Q.52** Solve the equation. $2x^2 - 7x + k = 0$ is $x = -\frac{1}{2}$ Find the value of k
- a) $k = -4$ b) $k = -5$ c) $k = -6$ d) $k = -7$
- Q.53** The term – to –term rule of the sequence 95, 87, 79, 71, is _____.
- a) Add 8 b) subtract 8 c) Multiply 8 d) Divide 8
- Q.54** The expression for the n th term of the 8, 10, 12, 14, 16, is
- a) $2n + 3$ b) $2n + 4$ c) $2n + 5$ d) $2n + 6$
- Q.55** Look at the sequence _____, - 13, - 9, - 5, ..., ...
What is its first term?
- a) - 13 b) - 15 c) - 17 d) none of these
- Q.56** The decimal form of 5^{-1}
- a) 0.1 b) 0.2 c) 0.4 d) 0.5
- Q.57** The fraction of the recurring decimal $0.\dot{8}$ is
- a) $\frac{5}{7}$ b) $\frac{8}{9}$ c) $\frac{4}{5}$ d) none of these
- Q.58** Simplify $11^0 + 11^{-1} + 11^{-2}$
- a) $\frac{130}{121}$ b) $\frac{131}{121}$ c) $\frac{133}{121}$ d) none of these
- Q.59** The fraction of the recurring decimal $0.\dot{1}\dot{2}$ is
- a) $\frac{2}{33}$ b) $\frac{4}{33}$ c) $\frac{5}{33}$ d) none of these
- Q.60** Which of the following is an irrational number.
- a) $\sqrt{144}$ b) $\sqrt{169}$ c) $\sqrt{2}$ d) $\sqrt{100}$
- Q.61** A sequence in which the third difference is same is known as _____ sequence.
- a) Linear b) Quadratic c) Cubic d) None of these
- Q.62** The next two terms of the sequence 100, 90, 75, 55, _____, _____, ...
- a) 30, 0 b) 45, 35 c) 85, 70 d) 30, 10
- Q.63** The general n th term for a cubic sequence is
- a) $an^3 + bn + c$ b) $an^3 + bn^2 + cn + d$
c) $n^3 + n^2 + 3$ d) None of these

- Q.64** The product of rational and irrational number is
 a) Prime b) Irrational c) Rational d) Integer
- Q.65** The systematic arrangement of numbers in a logical order is known as
 a) Terms b) Numbers c) Sequence d) Surd
- Q.66** The perimeter of a square with side length $= (\sqrt{5})^2$ is
 a) Rational b) Irrational c) Undefined d) None of these

Q.67 What is the area of shaded region in cm^2 (All measurements are in cm).

- a) 944 cm^2
 b) 946 cm^2
 c) 948 cm^2
 d) 950 cm^2



Q.68 A bag of marbles can be shared equally among 3, 7, or 8 students with no marble left. What is the least number of marbles in the bag?

- a) 160 b) 164 c) 168 d) 172

Q.69 $(\text{Rational})^2 + \text{Irrational} = \text{Irrational}$

- a) True b) False

Q.70 $\frac{1}{3}$ of animals are cows, $\frac{1}{4}$ are sheep, $\frac{1}{5}$ are horses, $\frac{1}{6}$ are deer and 4 dogs. How many animals are there altogether?

- a) 70 b) 80 c) 90 d) 100

Q.71 Two irrational numbers x and y are such that $\frac{x}{y}$ is a rational number.

- a) $x = \pi$ and $y = 3\pi$ b) $x = \sqrt{3}$ and $y = \sqrt{12}$
 c) $x = \sqrt{5}$ and $y = \sqrt{45}$ d) All of these

Q.72 For a sequence of numbers; "2, 5, 10, 17, 26,..." . Find an expression for the n th term.

- a) $n^2 + 1$ b) $n^2 + 2$ c) $2n^2 + 1$ d) $2n^2 + 3$

Q.73 One third of the sum of two angles is 60° and one quarter of their difference is 28° . Find the two angles.

- a) 32° and 142° b) 34° and 144°
 c) 34° and 146° d) none of these

- Q.74** 8 kg of potatoes and 5 kg of carrots cost \$28 whereas 2 kg of potatoes and 3 kg of carrots cost \$11.20. Find the cost of 1 kg of each item.
- a) \$2 and \$2.40 b) \$3 and \$3.60
c) \$4 and \$4.40 d) \$6 and \$6.40
- Q.75** \$80 is divide between Ethan and Michael such that one quarter of Ethan's share is equal to one sixth of Michael's share. How much does each of them receive?
- a) \$30, \$46 b) \$32, \$48
c) \$34, \$50 d) none of these
- Q.76** If $y^2 + 3y - 108 = 0$, then $y = \dots\dots\dots$?
- a) $y = 12$ and $y = 9$ b) $y = 12$ and $y = -9$
c) $y = -12$ and $y = 9$ d) $y = -12$ and $y = -9$
- Q.77** If $3a^2 + 11a + 6 = 0$, then $a = \dots\dots\dots$?
- a) $a = -3$ and $a = \frac{2}{3}$ b) $a = -3$ and $a = -\frac{2}{3}$
c) $a = 3$ and $a = -\frac{2}{3}$ d) $a = 3$ and $a = \frac{2}{3}$
- Q.78** The estimated value of $61 + 18.9$ correct to one significant figure is.....
- a) 8 b) 80 c) 800 d) 8000
- Q.79** The estimated value of $216.99 - 89.01$ correct to two significant figure is.....
- a) 321 b) 312 c) 131 d) 213
- Q.80** The cash price of a car was \$7640. Humair bought the car on the following conditions. 'A deposit of 20% of the cash price and 36 monthly payments of \$191.60'
The total amount Humair paid is _____.
- a) \$8425.60 b) \$8525.60 c) \$8625.60 d) none of these
- Q.81** As 1 US dollar = € 0.70 Euro, how many Euro will be in 11.5 US dollar ?
- a) 5.08 b) 5.80 c) 8.50 d) 8.05
- Q.82** Solve $400 - 40\%$ of 400
- a) 402 b) 204 c) 420 d) 240
- Q.83** A book costing \$ 40 is reduced by 20%. What is the new price of the book?
- a) \$0.32 b) \$3.2 c) \$32 d) \$320
- Q.84** In Thailand the total population of a town is 90300. Among these there are 8700 men. What is the percentage of men?
- a) 5.63 % b) 7.63 % c) 6.63 % d) 9.63 %
- Q.85** The formula for finding profit percentage is
- a) $\frac{\text{Original price}}{\text{Actual profit}} \times 100\%$ b) $\frac{\text{Original price}}{\text{Actual loss}} \times 100\%$
c) $\frac{\text{Actual profit}}{\text{Original price}} \times 100\%$ d) $\frac{\text{Actual loss}}{\text{Original price}} \times 100\%$
- Q.86** A car is bought for \$2400 and sold for \$2280. What is the loss percentage?
- a) 2% b) 3% c) 4% d) 5%
- Q.87** The values of 20% of 30 +10% of 20 is
- a) 2 b) 4 c) 6 d) 8

- Q.88** Solve 80% of 40 – 90% of 20 = ?
 a) 14 b) 41 c) 1.4 d) 4.1
- Q.89** 75% of 200 is greater than 85% of 200 ?
 a) Yes b) No
- Q.90** In a sale the wallet costing \$ 1050 is reduced by 10%. How much price is reduced?
 a) \$150 b) \$105 c) \$510 d) \$5
- Q.91** What is the value of 1 – 0.05 as percentage?
 a) 5.9 % b) 9.5 % c) 59 % d) 95 %
- Q.92** The price of a used car is decreased from \$2500 to \$2000. What is the percentage decrease?
 a) 0.2% b) 20% c) 2% d) 200%
- Q.93** The number 0.0004 in standard form is written as
 a) 4×10^{-4} b) 4×10^4 c) 0.4×10^{-4} d) none of these
- Q.94** If $x : 9 = 4 : x$, the positive value of x is _____.
 a) $x = 4$ b) $x = 5$ c) $x = 6$ d) $x = 7$
- Q.95** When \$ 143 is divided in the ratio 2:4:5. What is the difference between the largest and the smallest share?
 a) 29 b) 39 c) 49 d) 59
- Q.96** Eight men can dig a hole in 4 hours. How long will it take five men to dig the same size of the hole?
 a) 5 hours 25 minutes b) 4 hours 24 minutes
 c) 6 hours 24 minutes d) none of these
- Q.97** The HCF of $27x^3y^5z$ and $18x^2y^2z^3$ is _____.
 a) $9x^3y^3z$ b) $18x^4y^3z$
 c) $9x^2y^2z$ d) none of these
- Q.98** The area of the surface of the earth is about 510000000 km². Express this in standard form.
 a) 5.1×10^8 b) 51×10^9 c) 510×10^7 d) none of these
- Q.99** Express $(0.0002)^4$ in standard form.
 a) 16×10^{-14} b) 1.6×10^{15}
 c) 1.6×10^{-15} d) none of these
- Q.100** Oil flows through a pipe at a rate of 40 m³/s. How long will it take to fill a tank of volume 1200 m³.
 a) 10 seconds b) 20 seconds c) 30 seconds d) 40 seconds
- Q.101** A rich man leaves his fortune of \$48000 to be divided equally between his 12 grandchildren. How much does each child receive?
 a) \$ 1000 b) \$ 2000 c) \$ 3000 d) \$ 4000
- Q.102** The formula for compound interest _____.
 a) $(1 + \frac{r}{100})^n$ b) $P(1 + \frac{r}{100})^n$
 c) $2P(1 + \frac{r}{100})^n$ d) $P(1 + \frac{r}{100})^{2n}$
- Q.103** A new scooter is valued at \$15000. At the end of each year, its value is reduced by 15% of its value at the start of the year. What will be its worth after 3 years?
 a) \$ 6211.8 b) \$ 8211.8 c) \$ 7211.8 d) \$ 9211.9

Q.104 The gradient of the line can be calculated by the formula:

- a) $m = \frac{y_2 - y_1}{x_2 - x_1}$ b) $m = \frac{x_2 - x_1}{y_2 - y_1}$
c) $2m = \frac{y_2 - y_1}{x_2 - x_1}$ d) none of these

Q.105 If $y = \frac{1}{5}x + 4$, then y intercept is:

- a) 4 b) 41 c) 14 d) 0.2

Q.106 For a right angled triangle, Pythagoras theorem is

- a) $\text{Base}^2 = \text{Hyp.}^2 + \text{Perp.}^2$ b) $\text{Base}^3 = \text{Hyp.}^3 + \text{Perp.}^3$
c) $\text{Hyp.}^2 = \text{Base}^2 + \text{Perp.}^2$ d) none of these

Q.107 The radius of a circle is increased by 20 %. Find the percentage change in the area of the circle.

- a) 42 % b) 44 % c) 46 % d) 48 %

Q. 108 An article is advertised for \$320.25 inclusive of a 13% of GST. Find the original price.

- a) 273.41 b) 263.41 c) 278.62 d) 293.41

Q.109 What is the next number in the Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ?

- a) 35 b) 45 c) 55 d) 65

Q.110 In statistics, the middle value of an ordered set of values is called what?

- a) Mean b) Mode c) Median d) none of these

Q.111 Which of the following proportions is correct if $12 = pq$?

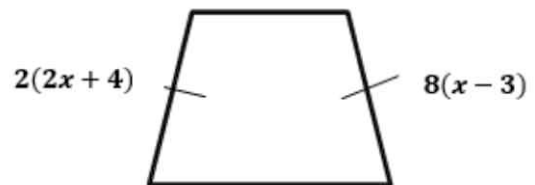
- a) $p : 2 = 6 : q$ b) $4 : p = 3 : q$
c) $6 : p = 2 : q$ d) $4 : q = p : 3$

Q.112 A car travels across Texas “m” miles at the rate of “x” miles per hour. How many hours does the trip take?

- a) $\frac{m}{x}$ b) $\frac{x}{m}$ c) $m - x$ d) $x - m$

Q.113 Work out the value of x in the given trapezium. All measurements are in cm.

- a) $x = 6$
b) $x = 8$
c) $x = 10$
d) $x = 12$



Q.114 The mean mass of four statues is 70kg. Ahmad buys one more whose mass is 40kg. Work out the mean mass of five statues.

- a) 68 kg b) 66 kg c) 67 kg d) 64 kg

Q.115 Complete "30% of 90 = 10% of _____"

- a) 27 b) 90 c) 270 d) 2700

Q.116 Find the midpoint of the line segment PQ, where P is the point (0, 9) and Q is (10, 5).

- a) (5,10) b) (5,3) c) (5,7) d) none of these

Q.117 P is the point (12,0) and the midpoint of PQ is (7, - 8). Find the coordinates of Q.

- a) (2,16) b) (3,16) c) (2,- 16) d) none of these

Q.118 \$600 is divided between David, Julia and Alex so that David has twice as much as Julia and Julia has three times as much as Alex. How much does each of them received?

- a) Alex = 60, Julia = 180, David = 360
 b) Alex = 70, Julia = 210, David = 350
 c) Alex = 80, Julia = 240, David = 320
 d) none of the above

Q.119 The following stem – and – leaf diagram shows the playing times, to the nearest minutes, of some Urdu dramas of Pakistan television.

How many of the dramas lasted less than 2 hours?

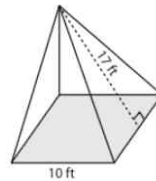
- a) 1 drama
 b) 2 dramas
 c) 3 dramas

Key: 10 | 1 means 101 minutes.

10	1	4	9				
20	2	2	2	6	7	8	9
30	0	1	2	4	5	6	7
40	2	4	6	6			

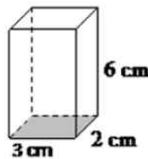
Q.120 The total surface area of square based pyramid is:

- a) 440 square feet
 b) 520 square feet
 c) 530 square feet



Q.121 The volume of given cuboid is:

- a) 36 cubic centimetres
 b) 38 cubic centimetres
 c) 40 cubic centimetres
 d) 42 cubic centimetres



Q.122 Solve for x.

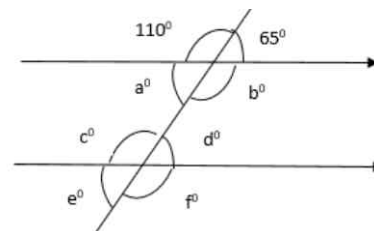
$$\log_3(x + 2) + \log_3(x - 2) = \log_3(2x - 1)$$

- a) x = 2 b) x = 3 c) x = 4 d) x = 5

Q.123 In the diagram, the sizes of two angles are marked.

What other angles are 110

- a) b, c and f
 b) a, d and e
 c) none of these

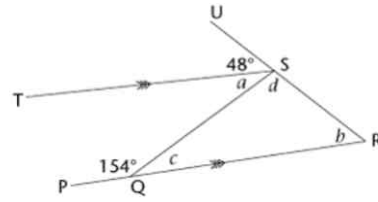


Q.124 What other angles are 65° .

- a) b, c and f
- b) a, d and e
- c) none of these

Q.125 Find the value of angle a .

- a) $\angle a = 26$ degrees
- b) $\angle a = 28$ degrees
- c) $\angle a = 30$ degrees

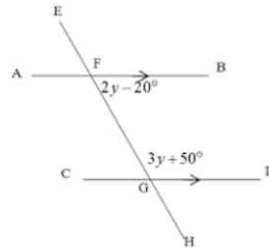


Q.126 Find the value of angle d .

- a) $\angle d = 102$ degrees
- b) $\angle d = 104$ degrees
- c) $\angle d = 106$ degrees

Q.127 Find the value of angle c .

- a) $\angle c = 26$ degrees
- b) $\angle c = 28$ degrees

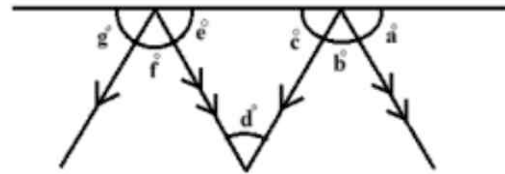


Q.128 The value of y is:

- a) $y = 10$
- b) $y = 20$
- c) $y = 30$
- d) $y = 40$

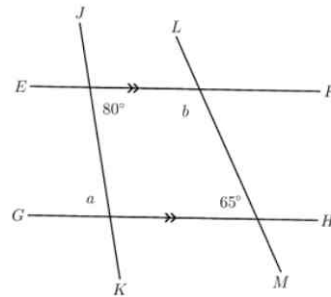
Q.129 The angles b, d and f equal because:

- a) they are alternate angles
- b) they are corresponding angles
- c) both a and b
- d) none of these



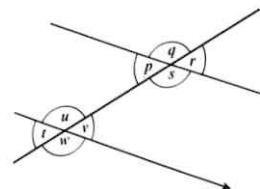
Q.130 Find the value of the marked angles a° and b° .

- a) $a = 80$ degrees, $b = 115$ degrees
- b) $a = 75$ degrees, $b = 125$ degrees
- c) $a = 85$ degrees, $b = 135$ degrees
- d) none of these



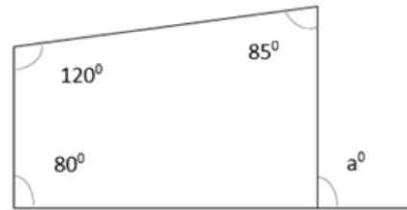
Q.131 The angles p and t are _____ angles.

- a) Alternate angles
- b) Corresponding angles
- c) Vertically opposite angles
- d) none of these



Q.132 Find the value of angle "a".

- a) 65 degrees b) 105 degrees
c) 85 degrees d) 95 degrees

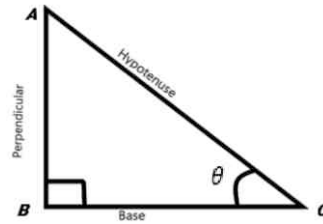


Q.133 The sides of two squares are 8 cm and 12 cm. Find the ratio of their perimeters.

- a) 1 : 2 b) 2 : 3 c) 3 : 4 d) 4 : 5

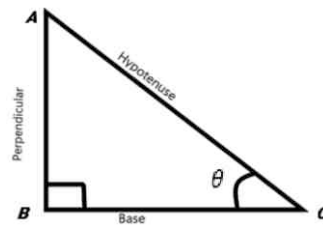
Q.134 In given right angle triangle ABC,

- a) $\cos \theta = \frac{BC}{AC}$ b) $\cos \theta = \frac{AB}{BC}$
c) $\cos \theta = \frac{AC}{AB}$ d) none of these



Q.135 In given right angle triangle ABC,

- a) $\sin \theta = \frac{BC}{AB}$ b) $\sin \theta = \frac{AB}{BC}$
c) $\sin \theta = \frac{AB}{AC}$ d) none of these

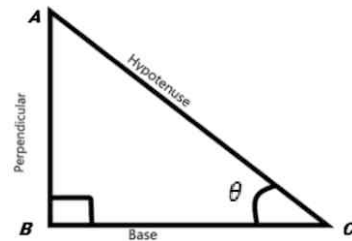


Q.136 In given right angle triangle ABC,

- a) $\tan \theta = \frac{BC}{AB}$ b) $\tan \theta = \frac{AB}{BC}$
c) $\tan \theta = \frac{AC}{AB}$ d) none of these

Q.137 In given right angle triangle ABC, hypotenuse is

- a) AB b) BC
c) AC d) none of these



Q.138 If $\operatorname{cosec} \theta = \frac{13}{5}$, then the value of $\sin \theta$ is _____.

- a) $\frac{5}{13}$ b) $\frac{13}{5}$ c) $\frac{5}{12}$ d) none of these

Q.139 If $\operatorname{cosec} \theta = \frac{13}{5}$, then the value of $\cos \theta$ is _____.

- a) $\frac{12}{13}$ b) $\frac{12}{5}$ c) $\frac{5}{12}$ d) none of these

Q.140 If $\operatorname{cosec} \theta = \frac{13}{5}$, then the value of $\tan \theta$ is _____.

- a) $\frac{12}{13}$ b) $\frac{12}{5}$ c) $\frac{5}{12}$ d) none of these

Q.141 $\cos^2 \theta + \sin^2 \theta =$ _____.

- a) 0 b) 1 c) 2 d) 3

Q.142 $\sec^2 \theta - \tan^2 \theta =$ _____.

- a) 0 b) 1 c) 2 d) 3

Q.143 $\sec \theta \times \cot \theta =$ _____.

- a) $\sin \theta$ b) $\cos \theta$ c) $\frac{1}{\sin \theta}$ d) $\frac{1}{\cos \theta}$

Q.144 If $\tan \theta = \sqrt{3}$, then θ is equal to

- a) 45° b) 90° c) 60° d) 30°

Q.145 If $\sin \theta = \frac{\sqrt{3}}{2}$, then θ is equal to

- a) 45° b) 90° c) 60° d) 30°

Q.146 If $\cos \theta = \frac{1}{\sqrt{2}}$, then θ is equal to

- a) 45° b) 90° c) 60° d) 30°

Q.147 If $\theta = 300^\circ$, then $\sec(-\theta) =$ _____.

- a) 0.5 b) 2 c) -2 d) $3/2$

Q.148 The terminal side of angle 330° lies in the _____ quadrant.

- a) 1st b) 2nd c) 3rd d) 4th

Q.149 If we divide the circumference of the circle into 360 equal arcs, then the angle subtended at the centre of the circle by one arc is _____.

- a) 1 degree b) 1 radian c) 3 degrees d) 3 radians

Q.150 $180^\circ =$ _____ radians.

- a) 4π b) 3π c) 2π d) π

Q.151 Area of circular sector is:

a) $A = \frac{1}{2} r^2 \theta$

b) $A = \frac{1}{3} r^2 \theta$

c) $A = \frac{1}{4} r^2 \theta$

d) $A = \frac{2}{3} r^2 \theta$

Q.152 Two or more than two angles with the same initial and terminal sides are called _____ angles.

- a) adjacent b) terminal c) coterminal d) none of these

Q.153 The ratio between central angle and arc length of the circle is _____.

a) $l = r \times \theta$

b) $l = r \div \theta$

c) $l = r + \theta$

d) $l = r - \theta$

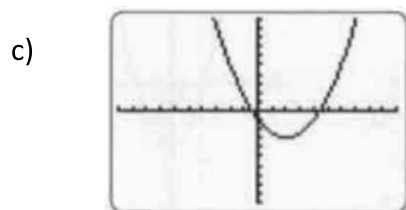
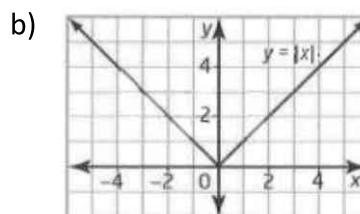
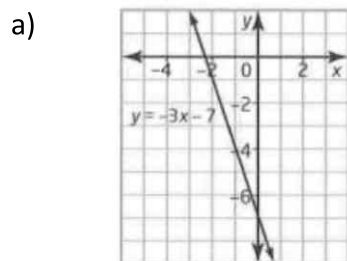
Q.154 The value of 1 radian = _____ degrees.

- a) 56.295 b) 57.296 c) 58.295 d) none of these

Q.155 The value of radius "r" when $l = 56 \text{ cm}$ and $\theta = 45^\circ$ is:

- a) 68.11 cm b) 69.11 cm c) 70.11 cm d) 71.3 cm

Q.156 Which graph represents a function?



- d) All of them

Q.157 Find the range $\{(-3, -2), (1, 4), (-6, 5), (-20, 7)\}$

a) Range = $\{-2, 4, 5, 7\}$

b) Range = $\{-2, -2, 4, 5, 7\}$

c) Range = $\{2, 4, -5, -7\}$

d) none of these

Q.158 Find the range of $\{(19, 12), (11, 5), (2, 2), (-4, 16), (-2, 1), (3, -3)\}$

a) Range = $\{12, 4, 5, -3\}$

b) Range = $\{-3, 1, 2, 5, 12, 16\}$

c) Range = $\{12, 14, -5, -7\}$

d) none of these

Q.159 Find the domain of $\{(1, 5), (3, 8), (5, 4), (7, 5), (13, 8), (6, 2)\}$

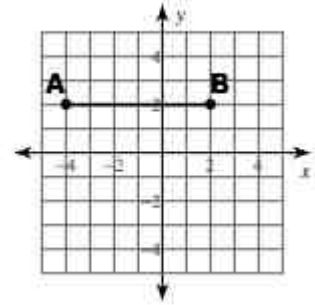
- a) Domain = $\{1, 3, 5, 6, 7, 13\}$ b) Domain = $\{2, 3, 5, 16, 17, 23\}$
 c) Domain = $\{2, 3, 6, 7, 8, 13\}$ d) none of these

Q.160 Find the domain of $\{(3, -2), (-3, -2), (-6, 5), (2, 3), (-20, 7)\}$

- a) Domain = $\{-10, -3, 4, 7, 21\}$ b) Domain = $\{-20, -6, -3, 2, 3\}$
 c) Domain = $\{4, 5, 6, 8, 9, 15\}$ d) none of these

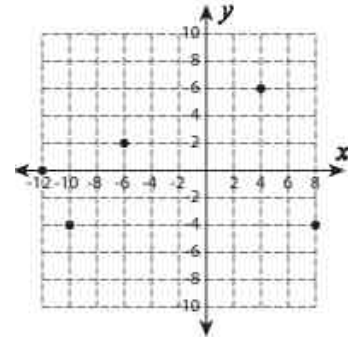
Q.161 Find equation of line AB.

- a) $y = 2$
 b) $x = 2$
 c) $y = -2$
 d) $x = -2$



Q.162 Find the domain and range of ordered pairs represented on the graph.

- a) Domain = $\{-10, -2, -1, 3, 5\}$, Range = $\{-6, -3, 1, 5\}$
 b) Domain = $\{-14, 10, 6, 5\}$, Range = $\{4, 0, 2, 3\}$
 c) Domain = $\{-12, -10, -6, 4, 8\}$, Range = $\{-4, 0, 2, 6\}$
 d) Domain = $\{4, -3, 2, 4, 5\}$, Range = $\{5, -4, 1, 2\}$



Q.163 If $f(x) = \frac{2}{5}x + 11$, find $f(-5)$ is _____.

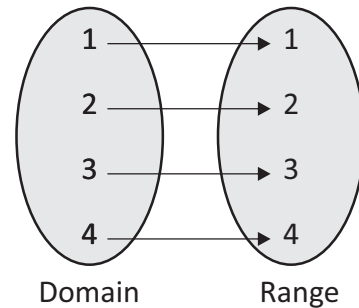
- a) 5 b) 7 c) 9 d) 11

Q.164 If $f(x) = \frac{3}{7}x - \frac{1}{7}$, then the value of $f(2)$ is _____.

- a) $\frac{3}{7}$ b) $\frac{4}{7}$ c) $\frac{5}{7}$ d) $\frac{6}{7}$

Q.165 Write the ordered pairs associated with given mapping diagram. Then state if the relation is a function.

- a) $\{(1, 1), (2, 4), (3, 9), (4, 16)\}$, function
 b) $\{(1, 1), (2, 4), (3, 9), (4, 16)\}$, not a function
 c) $\{(0, 1), (3, 5), (7, 9), (14, 16)\}$, not a function
 d) none of these



Answer Sheet

GRADE IX - X (MATHS)

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