Find the volume of sphere of radius is...

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1 MARK QUESTIONS

1. Explain why (3 × 5× 7 + 7) and (11 × 13 × 17 + 17) are composite numbers?

A. i) (3 × 5× 7 + 7) is a composite number because 7(3× 5 × 1+ 1) 1 has more than two factors.
ii) (11 × 13 × 17 + 17) = 17(11 × 13 + 1) 1
more than two factors
∴ 11 × 13 × 17 + 17 is composite number

2. The larger of two supplementary angles exceeds the smaller by 18°. Write equations of above information.

A. Let pair of supplementary angles x and y
Then we have $x + y = 180°$ —(1)
By problem $x = y + 18° \Rightarrow x - y = 18°$ —(2)

3. Find the roots of $x^2 - 3x - 10 = 0$.

A. Given Quadratic equation is
$x^2 - 3x - 10 = 0$.
$x^2 - 5x + 2x - 10 = 0$ $\quad -10x^2$
$x(x-5) + 2(x-5) = 0$ $\quad -5x + 2x$
$(x-5)(x+2) = 0$
$x = 5, -2$
∴ roots of the given quadratic equation is (5,–2)

4. If 2, 4, 6, 8, ... are in A.P. Find the 10th term?

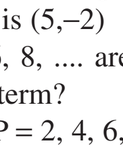
A. Given AP = 2, 4, 6, 8,...., Here a = 2
$d = t_2 - t_1 = 4 - 2 = 2$
10^{th} term $= t_{10} = a + 9d$
2 + 18 = 20

5. Find the volume of sphere of radius is 7 cm.

A. Volume of the sphere $= \frac{4}{3}\pi r^3$
Given that r = 7cm
$v = \frac{4}{3}\ \frac{22}{7} 7\ \ 7\ \ 7$
$= \frac{88\ \ 49}{3} = \frac{4312}{3}$
=1437.3 cubic cm
∴ Volume of the sphere = 1437.3 cm^3

6. Write the formula of curved surface area of cone and explain each term.

A. Curved surface area of cone = πrl



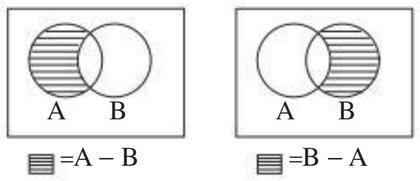
Where r = radius of cone
l = slant height of the cone.

7. If x, $x + 2$, $x + 6$ are three consecutive terms in G.P. Then find x?

A. Given x, $x + 2$, $x + 6$ are in G.P.
If t_1, t_2, t_3 are consecutive terms of G.P.
Then $\frac{t_2}{t_1} = \frac{t_3}{t_2}$ $\quad \therefore \frac{x+2}{x} = \frac{x+6}{x+2}$
$(x + 2)^2 = x(x + 6)$
$\Rightarrow x^2 + 4 + 4x = x^2 + 6x$
$\Rightarrow 4 + 4x = 6x$
$\Rightarrow 4 = 6x - 4x$
$\Rightarrow x = 2$

8. A – B, B – A represent on Venn diagram.

A. A – B B – A



=A – B =B – A

2 MARKS QUESTIONS

1. Find the quadratic polynomial, the sum and product of whose zeroes are – 3, and 2.

A. Given that sum of zeroes $= (\alpha + \beta) = -3$ and
Product of zeroes $= \alpha\beta = 2$
We know that if α, β are zeroes of Q.P. Then $P(x) = K[x^2 - x(\alpha + \beta) + \alpha\beta]$
$\therefore P(x) = K[x^2 - x(-3) + 2]$
$= K[x^2 + 3x + 2]$
If K = 1 then the required
$P(x) = x^2 + 3x + 2$

2. Write the all subsets of A = {1, 2, 3, 4}

A. Given set A = {1, 2, 3, 4}
Subsets = {1}, {2}, {3}, {4}, {1, 2}, {1, 3}, {1, 4}, {1, 2, 3}, {1, 3, 4}, {2, 3, 4}, {2, 3}, {2, 4}, {3, 4}, {1, 2, 4}, {1, 2, 3, 4} { }.
∴ No. of subsets of {1, 2, 3, 4} $= 2^4 = 16$

3. If $x^2 + y^2 = 25xy$ then prove that 2log $(x + y) = 3\log 3 + \log x + \log y$.

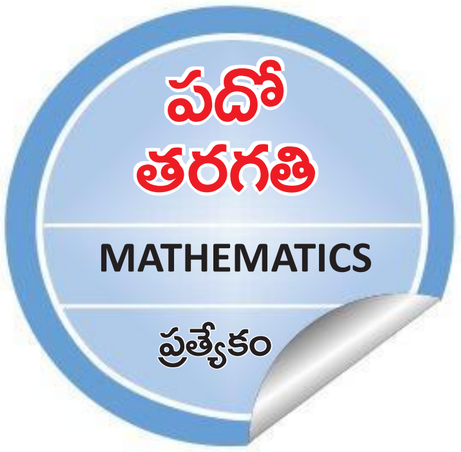
A. Given that $x^2 + y^2 = 25xy$
add $2xy$ on both sides
$x^2 + y^2 + 2xy = 25xy + 2xy$
L.H.S. is the form of $(a + b)^2 = a^2 + b^2 + 2ab$
$\therefore (x + y)^2 = 27xy$
Apply logarithms on both sides
$\log(x + y)^2 = \log 27xy$

$\left[\because (i) \log a^m = m \log a \right.$
$\left. (ii) \log abc = \log a + \log b + \log c\right]$

$2\log(x + y) = \log 27 + \log x + \log y$.
$2\log x + y = 3\log 3 + \log x + \log y$.

4. Find the value of k for which the pair of equations $2x - ky + 3 = 0$, $4x + 6y - 5 = 0$ represent parallel lines.

A. Given pair of linear equations are
$2x - ky + 3 = 0$,
$4x + 6y - 5 = 0$ are parallel lines
If pair of linear equations are parallel then they are in consistent
$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2} \Rightarrow \frac{2}{4} = \frac{-k}{6} \neq \frac{3}{-5}$



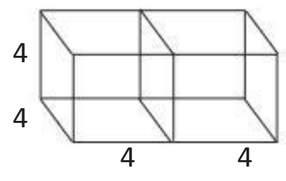
$\frac{2}{4} = \frac{-k}{6} \Rightarrow 12 = -4k \Rightarrow k = -3$

5. Find the 11th term from the last of the A.P. 10, 7, 4, … – 62.

A. Given A.P. 10, 7, 4, ..., –62
Here a =10, d = 7–10 = –3 & l = – 62
To find the eleventh term from the last term. We will find the total number of terms in the A.P.
$l = a + (n-1)d$
$-62 = 10 + (n-1)(-3)$
$= -72 = -3n + 3$
$-75 = -3n \Rightarrow n = 25$
So there are 25 terms in the given A.P. The 11th term from the last will be the 15th term of the series.
So $a_{15} = a + 14d$
$= 10 + 14(-3) = 10 - 42 = -32$

6. Two cubes each of volume 64 cm^3 are joined end to end together find the total surface area of the resulting cuboid.

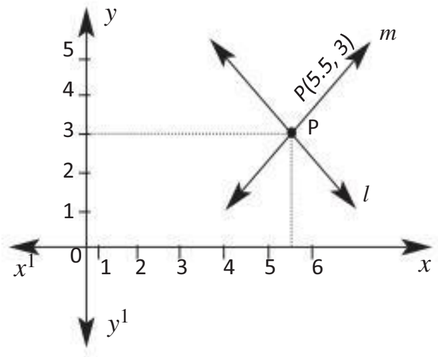
A. Given that volume of the cube
$= 64\ cm^3$
$\therefore a^3 = 64$
$a^3 = 4^3$
$\Rightarrow a = 4$



∴sides of the cube = 4
When two cubes are added the length of cuboid = 8cm
breadth = 4cm, height = 4 cm.
T.S.A. of cuboid $= 2(lb + bh + lh)$
$= 2(8\times4 + 4\times4 + 8\times4)$
$= 2(32 + 16 + 32)$
$= 160 cm^2$
∴T.S.A of cuboid is $160 cm^2$

7. Read the following picture and answer the questions.

A.



i) l & m line are___
ii) These line represents linear system. How many solutions are there.
iii) In linear system these lines are____

A. i) L & m lines are intersecting lines
ii) Unique solutions
iii) These lines are consistent

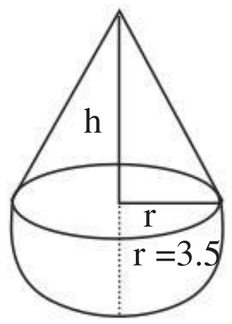
8. A heap of rice is in the form of a cone of diameter 12m and height 8m. Find its volume? How much canvas cloth is required to cover the heap?

A. Diameter of the heap (conical)
d = 12 m, r = 6 m
Height of the cone (h) = 8 m
Volume of the cone $V = \frac{1}{3}\pi r^2 h$
$= \frac{1}{3}\ \frac{22}{7}\ 6^2\ \ 8$
$= \frac{44\ \ 48}{7} = \frac{2112}{7} = 301.7 m^3$
To cover the canvas cloth we will find the curved surface area of cone.
CSA of cone = πrl
$l = \sqrt{h^2 + r^2} = \sqrt{8^2 + 6^2}$
$\sqrt{64 + 36} = \sqrt{100} = 10 = l$
$= \frac{22}{7}\ \ 6\ \ 10 = \frac{132\ \ 10}{7}$
$= \frac{1320}{7} = 188.5$ sq.m
∴188.5 sq.m. canvas cloth required.

4 MARKS QUESTIONS

1. A toy is in the form of a cone mounted on a hemisphere of diameter 7cm the total length of the toy is 14.5 cm find the volume of a toy.

A. Given that diameter of the cone = 7cm
r = 3.5 cm
Total height of the toy is 14.5 cm
height of the conical part = 11 cm



∴ volume of the cone $= \frac{1}{3}\pi r^2 h$
$= \frac{1}{3}\ \frac{22}{7} = 3.5\ \ 3.5\ \ 11$
$= \frac{11\ \ 35\ \ 11}{3} = \frac{423.5}{3} = 141.1 cm^3$
Volume of the hemisphere
$= \frac{2}{3}\pi r^3 = \frac{2}{3}\ \frac{22}{7}\ \ 3.5\ \ 3.5\ \ 3.5$
$= \frac{22\ \ 3.5\ \ 3.5}{3}$
$= \frac{269.5}{3} = 89.8 cm^2$
∴Total volume of the toy = volume of conical part + volume of hemispherical part =141.1 + 89.8 = 230.9 cm^3
∴Volume of the toy
= 230.9cm^3 (or) 231cm^3

2. A sum of Rs. 700 is to be used to give seven cash prizes to students of a school for their overall academic performance. If each price Rs. 20 less than its preceding prize. Find the volume of cash prize.

A. Given that sum of all cash prizes = Rs. 700
Each price differs by Rs. 20.
Let the prizes (in ascending order) be
x, x +20, x+40, x+60, x+80, x+100, $x + 120$
Sum of prizes $= s_7 = \frac{n}{2}[a + l]$
$= 700 = \frac{7}{2}[x + x + 120]$
$\Rightarrow 700\ \ \frac{2}{7} = (2x + 120)$
$\Rightarrow 200 - 120 = 2x$
$\Rightarrow 80 = 2x$
$\therefore x = 40$
∴ The required prizes are 40, 60, 80, 100, 120, 140, 160
1st prize to last prize cost = 160, 140, 120, 100, 80, 60, 40.