Answers by Maths blog Team Palakkad
Hitha kottayi , Jaseela Bemmanur and Athira Paruhtipully

Second Terminal Examination 2012

Maths

Class : 10

1) The difference between any two terms of an arithmetic sequence is a multiple of it's common difference . Since 100 is not a multiple of 7 the difference between any two terms of the given sequence can not be 100

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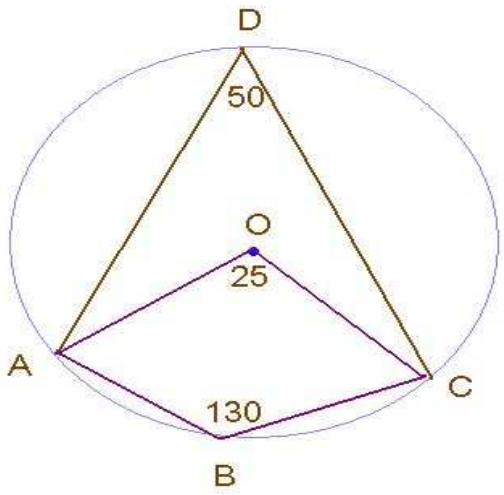
2)



It given as <ABC= 130^0 .

In cyclic quadrilateral ABCD , <D=50^0(Opposite angles of a cyclic quadrilateral)

Hence <AOC = 50x2 =100^0 (By theorem)

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3) Remainder obtained on dividing p(x) by (x-2) is p(2)

$P(2) = 2(2)^3-3(2)^2+5(2)-10$

$= 16-12+10-10 = 4$

The remainder is 4

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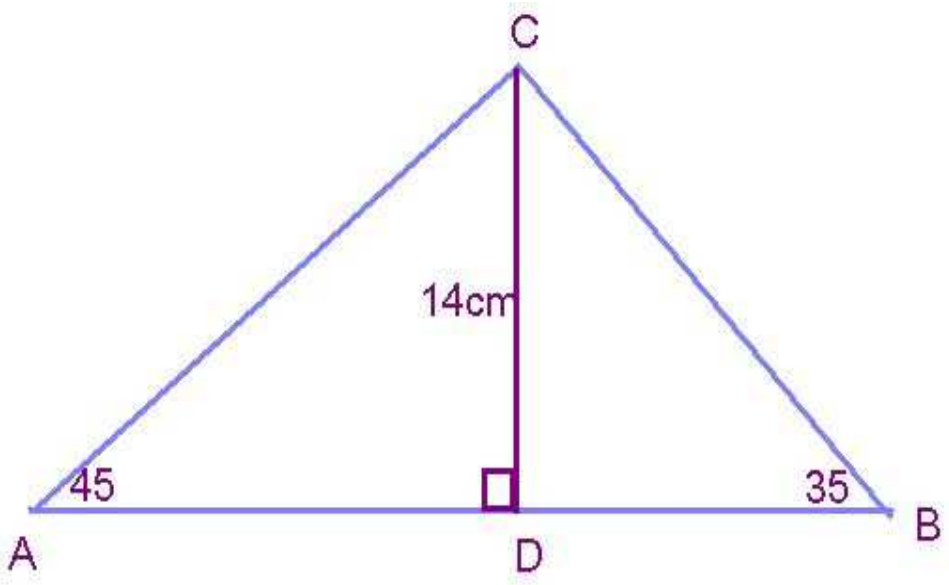
4)



In ΔACD angles are 45,45,90 hence sides are in the ratio $1:1:\sqrt{2}$. Since CD=14cm we have AD=14cm.

From ΔBCD

$$\text{tan } 35 = \frac{CD}{DB}$$

$$0.70 = \frac{14}{DB}$$

$$DB = \frac{14}{0.7} = 20$$

Therefore AB = AD+DB = 14+20 = 34 cm

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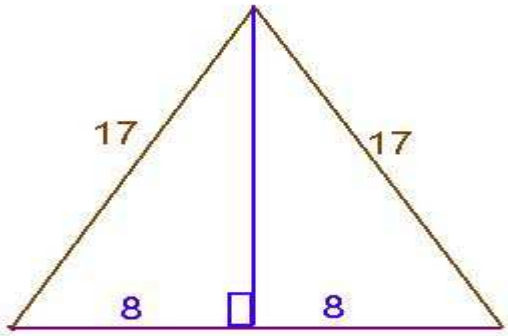
5)



$$l^2 = 17^2 - 8^2$$

$$l^2 = 289 - 64 = 225$$

$$l = \sqrt{289} = 17cm$$

Slant Height = 17cm

L.S.A = 2bl = 2x16x15 = 480cm^2

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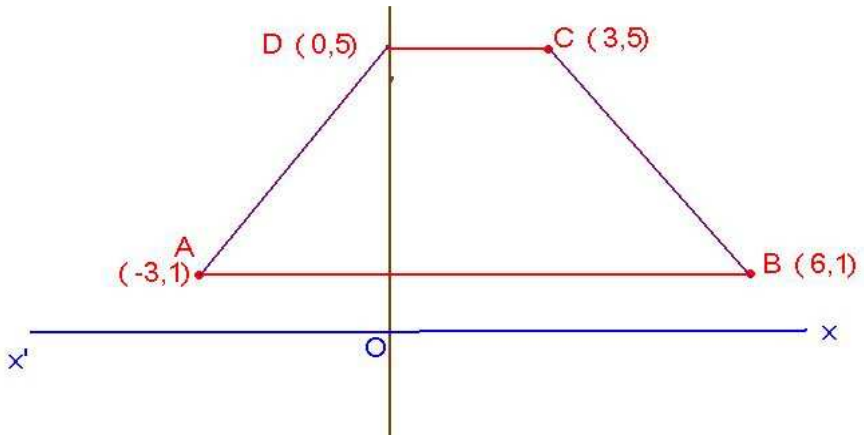
6)



ABCD is an isoceless trapezium

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7)

a) Probability of getting a black bead = $\frac{6}{18} = \frac{1}{3}$

b) Probability of getting a black bead in 2nd case = $\frac{7}{20}$

Probability of getting a black bead in the 1st case = $\frac{6}{18} = \frac{1}{3}$

$\frac{7}{20} > \frac{1}{3}$ **hence probability of getting a black bead increases in the 2nd case**

Probability of getting a white mead in 2nd case = $\frac{13}{20}$

Probability of getting a black bead in the 1st case = $\frac{12}{18} = \frac{2}{3}$

$\frac{13}{20} < \frac{2}{3}$ **hence probability of getting a white bead decreases in the 2nd case**

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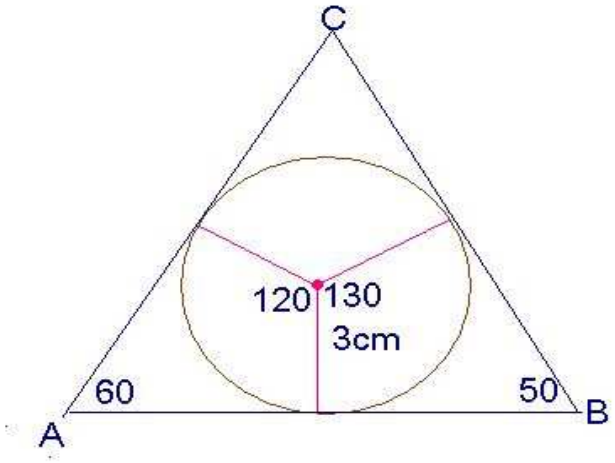
8)



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9)

a) Sum of angles in each polygon = (9-2)180= 7x180 = 1260^0

b) n x midterm = sum

9 x 5^{th} term = 1260

5^{th} term = 1260/9 = 140

Measure of each angle noticed by Dhanya is 140^0

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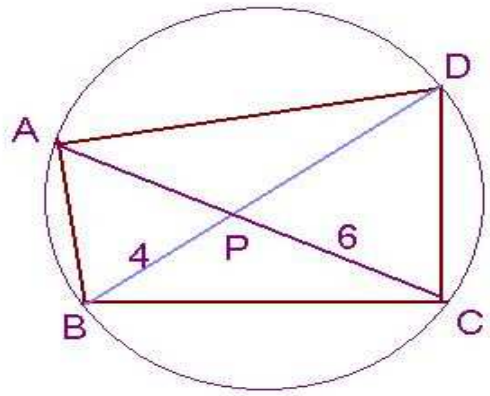
10)



Given as BD bisects AC also PC=6cm hence PA=6cm

PA x PC = PC x PA

6 x6 = 4 x PD

PD = 36/4 = 9cm

Hence AC = 12cm and BD=13cm

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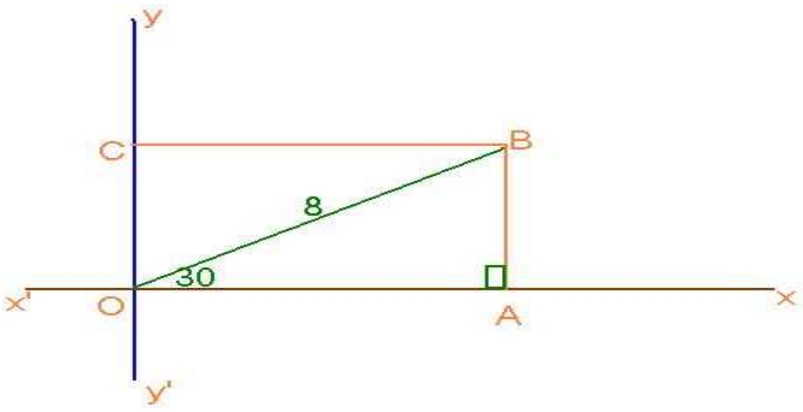
11) a) Probability of getting a perfect square in both slips = $\frac{24}{1250}$

b) Probability of getting multiples of 5 in both paper slips = $\frac{50}{1250}$

12)



In ΔOAB angles are 30^0,60^0,90^0 hence sides are in the ratio $1:\sqrt{3}:2$.

Since OB=8units we have AB=4units and OA= $4\sqrt{3}$ units.

Co ordinate of the point A is ($4\sqrt{3}$,**0)**

Co ordinate of the point B is ($4\sqrt{3}$,**4)**

Co ordinate of the point C is (**0,4)**

13)

Number of rows =x

Number of columns = 3x+1

$x(3x+1)=200$, $3x^2+x-200=0$

Solving we get x=8

Hence number of rows =8 and number of columns =25

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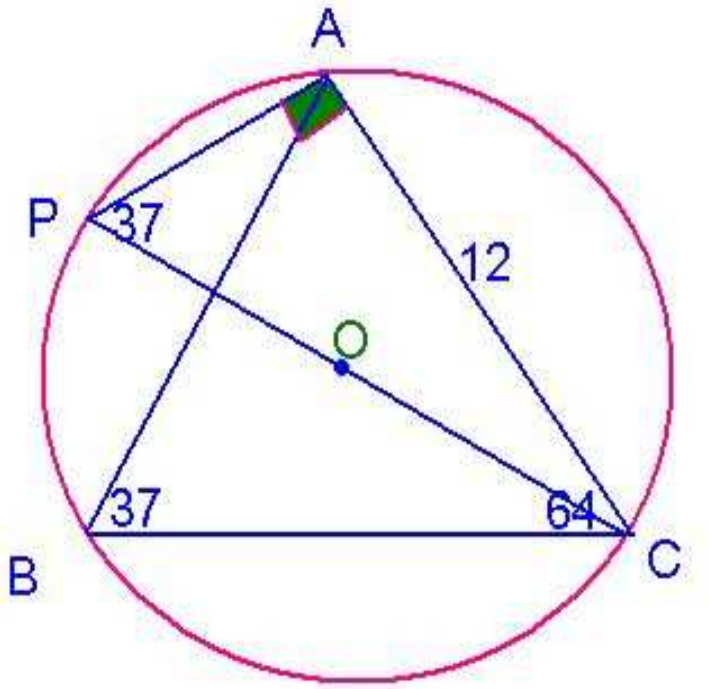
14)



<P=37^0 (Angles in same segment)

<PAC=90^0(Angle in a semicircle)

From ΔPAC

$$\text{sin } 37 = \frac{12}{PC}$$

$$0.60 = \frac{12}{PC}$$

$$PC = \frac{12}{0.6} = 20\text{cm}$$

Circum radius = 10cm

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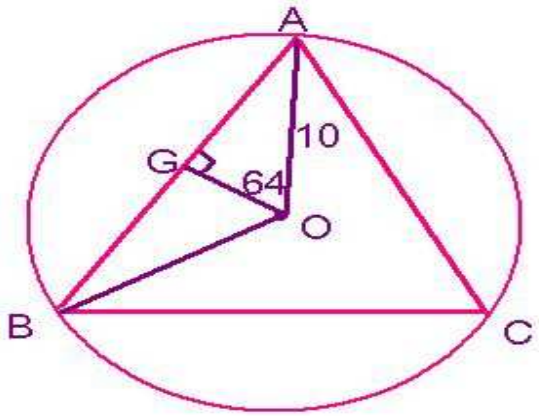

From ΔAOG

$$\sin 64 = \frac{AG}{10} \qquad 0.90 = \frac{AG}{10}$$

AG = 0.90 x 10 =9cm

AB = 2x9 = 18cm

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15)

$$\frac{x}{360} = \frac{r}{R}$$

$$\frac{288}{360} = \frac{r}{15}$$

r = 12cm . Radius of the cone =12cm

Volume of the cone = $\frac{1}{3} x\pi x12x12x9$

= 1356.48cm^3

Volume in liters = 1356.48/1000 = 1.356 > 1.5

Hence the vessel is not sufficient to buy 1.5 liters coconut oil

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16)

<ADB=50^0 (Each angle between a chord and the tangent ao one of it's ends in a circle is equal to the angle in the segment on the other side of the chord ,
<CBD=40^0 (")

<BDC=20^0

<BCD=120^0 (angles in a triangle)

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17)

a) $3(2)^3-13(2)^2+k(2)+12=0$

$24-52+2k+12=0$

$2k=52-36=16$

$k=8$

$p(x)=3x^3-13x^2+8x+12$

b) remainder obtained on dividing p(x) by (x-1)is p(1)

p(1)=3-13+8+12=10

Remainder is 10

c) -10 is to be added to become (x-1) a factor

Or

$P(x) =6x^2-x-2$

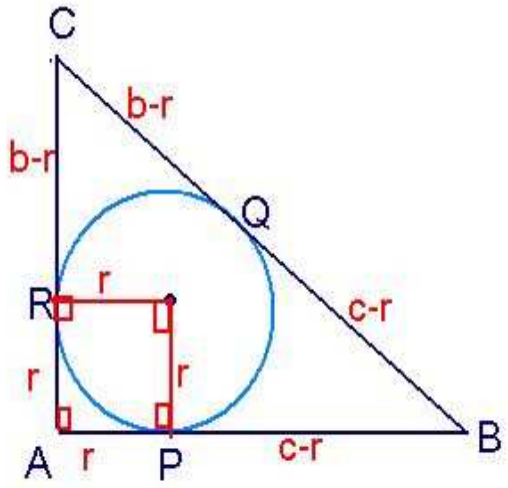
P(x)=0

$6x^2-x-2 = 0$ solving we get x= 2/3 and x= -1/2

If p(2/3)=0 (3x-2) is a factor If p(-1/2)=0 (2x+1) is a factor

Hence the first degree factors are (3x-2) and (2x+1)

18)



Let AB=c , AC=b and BC=a . O be the incentre of ΔABC and r be the inradius

<ORA =90^0(radius and tangent) in the same way <OPA=90^0. <A=90^0(given)

Hence <POR=90^0(angles in a quadrilateral). Therefore OPAR is a square of sides'r'.

AP=AR=r(tangents from external points)

In the same war BP=BR =c-r , CQ=CR =b-r

b-r+c-r = a

b+c-a = 2r

AC+AB-AC =2r

Hence the proof

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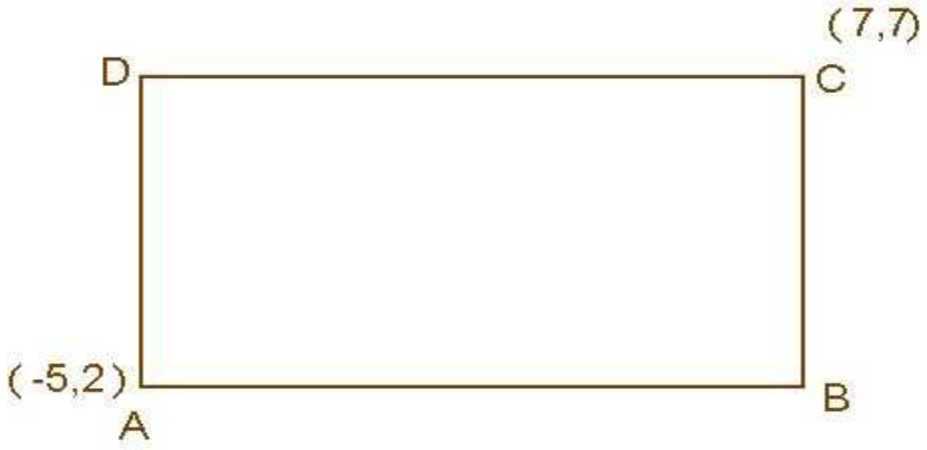
19)



a) **Coordinates of other vertices are B(7,2) and D(-5,7)**
b) **AB=12 units and AD=5 units**
c) **Length of diagonal = 13 units**

20) Construct incircle and measure the inradius

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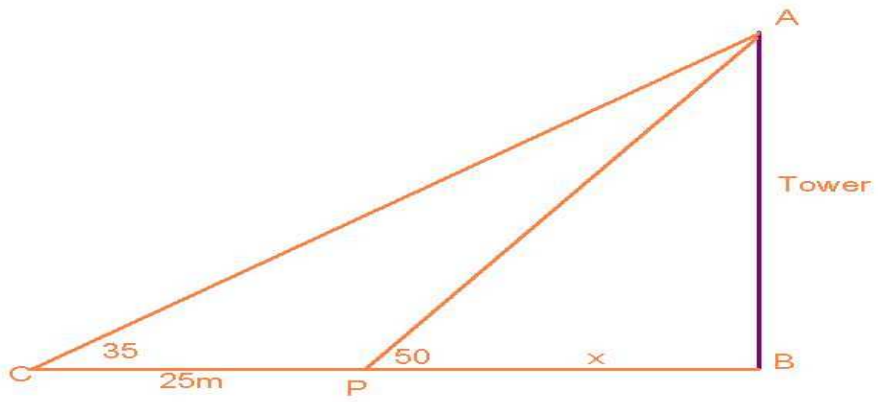
21)



In the figure AB represents height of the tower and P,C represents the position of boy. Let PB=x

From ΔABP

tan 50 = $\frac{AB}{x}$, **1.20 =** $\frac{AB}{x}$

AB = 1.20x----------(1)

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From ΔABC

tan35 = $\frac{AB}{BC}$ **0.7 =** $\frac{1.20x}{x+25}$

0.7x+17.5 = 1.2x

0.5x =17.5

x = 17.5/0.5 = 35

Height of tower = 1.2 x35 = 42m

22) $\frac{1}{3} x\pi\ xrxrx15 = 320\pi$

$5r^2$ = 320

r^2 = 64

r = 8cm

T.S.A = $\pi x8x17+\pi X8X8=200\pi$ **cm^2**

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23) There is a small mistake in the question. It is not square prism it is square pyramid

Let sides of the cube be 'a'

<u>Square pyramid</u>

Base edge ='a' and height =a then volume = $\frac{1}{3}a^3$

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Cone

Radius = ½ a and height = a then volume = $\frac{1}{3}x\pi x\frac{a^2}{4}xa=\frac{1}{3}xa^3x\frac{\pi}{4}$

Sphere

Radius = ½ a then volume = $\frac{4}{3}x\pi x\frac{a}{2}x\frac{a}{2}x\frac{a}{2}=\frac{1}{3}xa^3x\frac{\pi}{2}$

Ratio of volumes = $\frac{1}{3}a^3:\frac{1}{3}xa^3x\frac{\pi}{4}:\frac{1}{3}xa^3x\frac{\pi}{2}$ = **4 : π : 2π**