

Individual Test Solutions

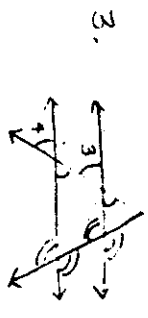
Geometry Test for March 1990 Regional

D. 1 by def. of adjacent angles

2. $S = (n-2)180$ $4x + 7x + 8x - 30 + 5x - 10 + 4x + 20 = 540$
 $S = (5-2)180$ $28x + -20 = 540$
 $S = 3(180)$ $28x = 560$
 $S = 540$ $x = 20$

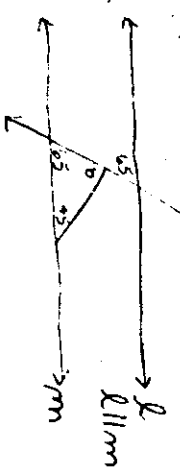
$4x = 80$; $7x = 140$; $8x - 30 = 130$; $5x - 10 = 90$; $4x + 20 = 100$

$80 + 140 = 220$

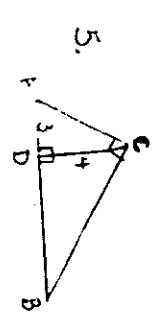


$\angle 1 \cong \angle 3$ $\angle 3$ and $\angle 4$ are
 $\angle 1 \cong \angle 4$ congruent because
 $\angle 2 \cong \angle 7$ they are corresponding
 $\angle 3 \cong \angle 4$ angles

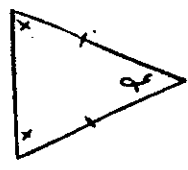
3. $\angle 3$ and $\angle 4$ are supplementary unless given right angles or \perp .



$b + 65 + 45 = 180$
 $b + 110 = 180$
 $b = 70$
 $b - c = 70 - 45 = 25$

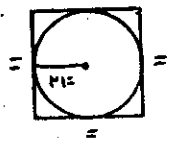


$CD^2 = AD \cdot DB$ $AB = AD + DB$
 $16 = 3(16)$ $AB = 3 + \frac{16}{3}$
 $\frac{16}{3} = DB$ $AB = \frac{9}{3} + \frac{16}{3} = \frac{25}{3}$

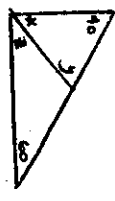


Case I
 $x + y = 65$
 $x + y = 130$
 $x + x + y = 180$
 $x + 130 = 180$
 $x = 50$
 $50, 50, 80$

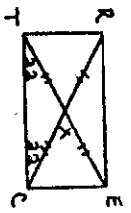
Case II
 $x + x + y = 180$
 $130 + y = 180$
 $y = 50$
 $65, 65, 50$



$C = 2\pi r$
 $= 2\pi(\frac{11}{2})$
 $= 11\pi$

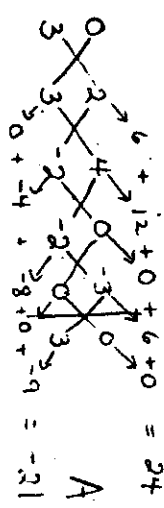


$y = z + 60$
 $y - 60 = z$



$x = 22 + 22 = 44$

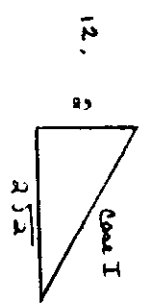
10. Place vertices in order.



$A = \frac{34 - 21}{2} = \frac{13}{2} = 6.5$

The sum of 2 sides of a triangle is greater than the 3rd side.

11. No A. {3, 5, 13} 3+5=8 9 is the largest for the 3rd side
 No B. {5, 6, 12} 5+6=11 6-5=1 yes 12 > 11
 No C. {11, 3, 23} 8+3=11 11 equals 11
 No D. {7, 1, 23} 7+1=8 8 equals 8

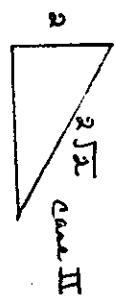


$$a^2 + b^2 = c^2$$

$$4 + 8 = c^2$$

$$12 = c^2$$

$$2\sqrt{3} = c$$

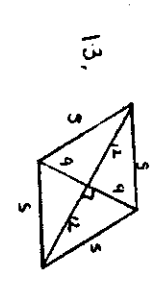


$$a^2 + b^2 = c^2$$

$$a^2 + 4 = 8$$

$$a^2 = 4$$

$$a = 2$$

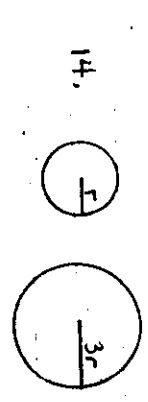


$$9^2 + 12^2 = 5^2$$

$$81 + 144 = 3^2$$

$$225 = 5^2$$

$$15 = 5$$



$$C_1 = 2\pi r$$

$$= 2\pi r$$

$$C_2 = 2\pi(3r)$$

$$= 6\pi r$$

(+tripled)
Mult by 3

15. Hero's Formula

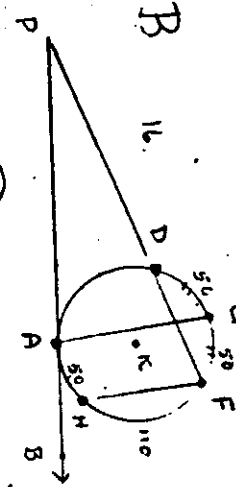
$$s = \frac{8+9+15}{2} = \frac{32}{2} = 16$$

$$\sqrt{s(s-a)(s-b)(s-c)}$$

$$\sqrt{16(8)(7)(1)}$$

$$8\sqrt{14}$$

Geometry - Indian Test Solutions



$$m\widehat{DA} + 50 + 50 + 110 + 50 = 360$$

$$m\widehat{DA} + 260 = 360$$

$$m\widehat{DA} = 100$$

$$m\angle P = \frac{1}{2} m\widehat{DA}$$

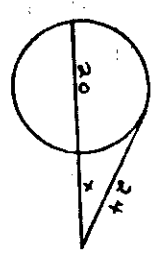
$$= \frac{1}{2} (100)$$

$$= 50$$

A 17. $\sin 30^\circ + \cos 60^\circ + 2 \sin 45^\circ$

$$\frac{1}{2} + \frac{1}{2} + 2\left(\frac{\sqrt{2}}{2}\right)$$

$$1 + \sqrt{2}$$



$$x(x+20) = 2x^2$$

$$x^2 + 20x = 576$$

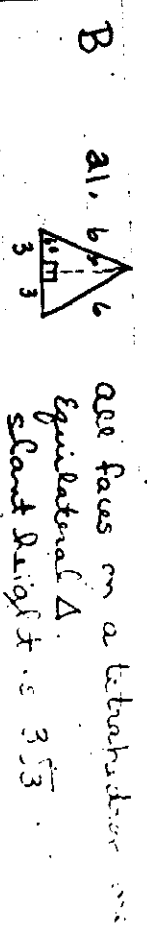
$$x^2 + 20x - 576 = 0$$

$$(x-16)(x+36) = 0$$

$$x = 16$$

A 19. Formula $\frac{(n-3)n}{2} = \frac{47(50)}{2} = 1175$

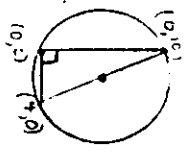
A 20. $\frac{360}{n} = \frac{360}{36} = 10$



all 6 faces are equilateral
slant height is $3\sqrt{3}$

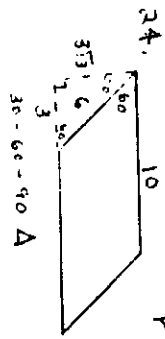
22. $m\angle B = \frac{(6-2)180}{2} = \frac{2}{3}(180) = 120$

$S = \frac{2(\frac{3}{2})}{\sqrt{3}} = \frac{3}{\sqrt{3}} = \frac{3\sqrt{3}}{3} = \sqrt{3}$



midpt of diameter $(\frac{0+4}{2}, \frac{2+0}{2}) = (2, 1)$

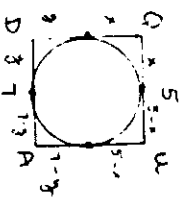
Ch: $r = \sqrt{(2-0)^2 + (1-0)^2} = \sqrt{4+1} = \sqrt{5}$
 $r = \sqrt{4+25} = \sqrt{29}$



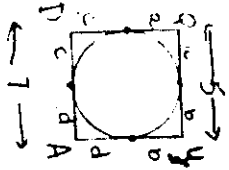
$A = hb = (3\sqrt{3})(10) = 30\sqrt{3}$



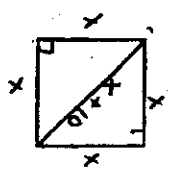
$P = 6(2) = 12$



$x + 5 - x + y + 1 - y = 5 + 1 = 12$

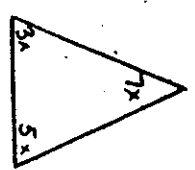


$QU = a + b = 5$ $PA = c + d = 7$
 $QD + UA = (a+c) + (b+d) = (a+b) + (c+d) = 5 + 7 = 12$



$x\sqrt{2} = x + 10$
 $x(\sqrt{2}-1) = 10$

$x = \frac{10}{\sqrt{2}-1} \cdot \frac{\sqrt{2}+1}{\sqrt{2}+1} = \frac{10\sqrt{2}+10}{2-1} = 10\sqrt{2}+10$



$15x^2 = 180$
 $x = 12$

$7x = 7(12) = 84$

29. $5x + x = 180$
 $6x = 180$
 $x = 30$

$5x = 5(30) = 150$

$150(12) = 1800$

$\frac{360}{n} = 30$
 $\frac{360}{30} = n$
 $12 = n$

30. $V = \frac{4}{3}\pi r^3$
 $288\pi = \frac{4}{3}\pi r^3$
 $216 = r^3$
 $6 = r$

$S = 2\pi r^2 + 2\pi r h$
 $= 2\pi(36) + 2\pi(6)(6)$
 $= 72\pi + 72\pi = 144\pi$

$V = \pi r^2 h$
 $288\pi = \pi(6)^2 h$
 $8 = h$

Geometry - Indian Test Solutions