multille m # " Institute m X 3 multille m # 3 Institute \$ 75 'S multine m # " multille m H 3 State Mathematics Contest Finals movinte # ** ** 而时间的新祥等除 maximue # # 3 PS Ro Ro 1. A square is inscribed and circumscribed by two circles as mutate the the shown. What is the ratio of the larger circle's circumference to the smaller circle's circumference? b) $\sqrt{2}$:1 c) $\sqrt{\pi}$:1 a) 2:1 d) 3:2 multille # # 3 PS Withit the the the - 13 Ph e) Cannot be determined Ro 2. Consider a right triangle with an area 120 cm^2 and a perimeter of 60 cm. What is the length of its hypotenuse? Ro au c) 26 cm ... d) 27½ cm ... e) 30 cm tinstitute ### tastitute ### b) 24 cm a) 20 cm (within nearest 100 ft²) surface area of the walls? a) 500 m^2 3. A room with dimensions 15 ft \times 20 ft and an 8 ft ceiling has a large (84 in \times 96 in) window unit and a door (84 in \times 36 in). Its walls need painting. Find the approximate 物林海绵 R. d) $2,400 \text{ ft}^2$ e) none of these R. 4. A rectangular field is partitioned into four rectangular Institute ## # **330** m² 450 m² parcels. The areas of three of these parcels are as shown. Determine the area of the field. 600 m² 440 m^2 b) 1,800 m² c) $1,820 \text{ m}^2$ a) multille # # '& R mythute ## # '& PL d) 1,840 m² titute the the 'S PE e) $8,190 \text{ m}^2$ Ro 5. Determine the next element in this sequence of ordered pairs: $\{(0, 1), (2, 1), (2, 3), (4, 5), (6, 9), (10, 15), \ldots\}.$ -1) Millitte 新林 後 梯 而此此他新林塔像 a) (16, 23) b) (16, 25) c) (14, 25) d) (14, 27) e) (16, 27) Ro stitute the stitute # stitute # to the the the to the the the to the the the to the the the to the We B PR to the We B We Ro

6. Which of the following statements is NOT true about a right triangle? mistime m #

multille m # "

multilite m # "

Y.

N.

Y.

to the the B. Ph.

Ro

to the We B

multille m # "

- a) The smallest arc connecting the three vertices forms a semicircle.
- b) The measure of the two smaller angles equals the larger angle.
- c) All right triangles can be partitioned into two similar triangles.
- d) Its area is twice the product of the lengths of the two shorter sides.
- e) Its perimeter never exceeds $(1+\sqrt{2})$ times the length of its longest side. 加城 城 加城水浅
- withthe start to 18 mutate # # 'S institute ## 7. You are asked to pull out (without replacement) three letters from a bowl containing the first ten letters of the alphabet, A - J. What is the chance that these letters rearrange to spell "BAD"? a) $\frac{3}{10}$ b) $\frac{1}{1000}$ c) $\frac{3}{500}$ d) $\frac{1}{720}$ e) $\frac{1}{120}$ (100) matinte # # '\$

multine m # "

multinu m # "

multille m # 3

而此此此称林塔梯

Ro 8. Two perpendicular chords of a circle intersect at point P. institute # matitute \$ stitute # If AP = 1.8 and BP = 5.0 determine CD. 1.8 d) 6.4 b) 5.2 c) 6.0 a) 3 5.0 в e) None of these 而如此他就林塔张 前加加新林等隊 stitute \$ # 3 PS Withthe ## # 13 PK 9. Find the area of a right triangle whose two longest sides have lengths 24 and 25. Y.



to the the B Ph

to the W. B. P.

to the W. B. M.

the the the the







mouture # # * * * 28. A piece of decorative ribbon is to be wrapped three times around a cylindrical container starting at the top and ending at bottom. If the container is 40 cm tall and has a diameter of 20 cm, what is the minimum length of the ribbon in centimeters?

multilite # # *

Institute # # *

Institute \$7 \$7 'S

b) $20\sqrt{13} \cdot \pi$ c) $20\sqrt{4+9\pi^2}$ 医额状 落像 a) 40+60π d) 60π e) none of these

millitute ### 29. Harold forgot to write down a very important phone number. All he remembers is that it started with 713 and that the next set of 4 digits involved 1, 7 and 9 with one of these the number correct? numbers appearing twice. If he guesses a phone number what is the chance that he gets 加北新林塔梯

c) 1 in 24 d) 1 in 81 b) 1 in 72

mistille # ****

30. Chris is riding her bicycle and wants to know how fast she matinte # is going. She is pedaling 80 turns in a minute. There are 40 cogs on the front sprocket and 16 cogs on the back wheel gear. If the wheel has a diameter of 70 cm and you use 22/7 as an approximation of π , roughly how fast is she going? tinistitute \$6 \$

a) 10.6 km/h b) 26.4 km/h d) 44.0 km/h e) e) none of these

cogs

16 cogs

Astitute # # 13 PK

to the the of the

坂^谈浅彩

e) 1 in 27

length of its perimeter? 31. A right triangle with area 330 cm^2 has as its shortest side of length 11 cm. What is the

c) 42.2 km/h

c) 121 cm b) 60 cm

e) 22½°

Withthe the the 'S PR

** 松林 浅

d) 144 cm

Astitute ## # 18

to the th

e) none of these

32. Consider the right triangle with points on its sides B hittite the state as shown. If AB = BC = CD = DE = EF determine $m \angle FAE$. c) 18° a) 10° b) 15° С

mininte # # B

而时间推新林塔梯 d) 20°

to the the the

Ro

to the the B

multille m # *

Ro

Ro

Ro

Ro

Ro

Ro

Ro

Institute # **

而此此他称并安然 Ro 33. An aquarium measuring 50cm×30cm×40cm holds 132 lbs of water. If each dimension of the tank is increased by 10cm, what is the weight of the water if that tank is filled? a) 120 lbs b) 162 lbs c) 171.6 lbs d) 264 lbs e) none of these multilite # # '\$ N. 34. The interior angles of a pentagon have the following measures: x^{o} , x^{o} , $2x^{o}$, $3x^{o}$, $5x^{o}$ Determine x. matitute 新林 後a) 30 d) 72 b) 45 c) 60 tinte # # '3 1% Ro e) none of these 35. The triangle $\triangle ABC$ with altitude \overline{CD} and point E on side $\Delta ADE \cong \Delta CBD$. By what fac ΔABC larger than the area of ΔADE ? \overline{AC} has $\Delta ADE \cong \Delta CBD$. By what factor is the area of c) $\frac{1+\sqrt{5}}{2}$ Ro ~ a) 2.5¹¹¹¹¹¹ b) $\sqrt{5}$ Đ. d) $1 + \frac{\sqrt{5}}{2}$ e) $\frac{3 + \sqrt{5}}{2}$ multille ## # 18 multilite # # 13 PR 而此此版教林省梯 mutute ## # 3 PS Ro 36. George, lost in the dessert, starts at point A travels 4 km north, then turns and continues 3 A from point B? km east, then turns southwest and continues $\sqrt{8}$ km and ends at point B. How far is point b) $(5 - \sqrt{8})$ km c) $\sqrt{13}$ km d) $\sqrt{17}$ km e) $\sqrt{5}$ km Yh. a) 3 km 山北新林塔梯 N. 37. $\triangle ABC$ has sides that measure 12, 9, 7. Three circles, each centered at one of the Institute # Astitute # triangle's vertices are mutually tangent as shown. (Note that the image is not to scale.) Calculate the radius of the largest of the three circles. , o c) 6½ a)5 面的抽版新林·诺·院 d) 20 d) 7 Y. B **探**^沃荡 to the the B Ph to the We B PS to the the B to the the B to the the By to the the B Ph Ro

Institute \$ 75

multille m # "

minitute # **

Institute \$ ** **

Institute \$ ** **

multille m # "

