

Plant City High School

Geometry Individual

Answers

1. d
2. d
3. c
4. a
5. d
6. b
7. b
8. c
9. b
10. b
11. a
12. b
13. b
14. d
15. d
16. b
17. c
18. d
19. e
20. d
21. c
22. b
23. d
24. c
25. b
26. c
27. c
28. c
29. b
30. a

Mu Alpha Theta Invitational
February 24, 2001

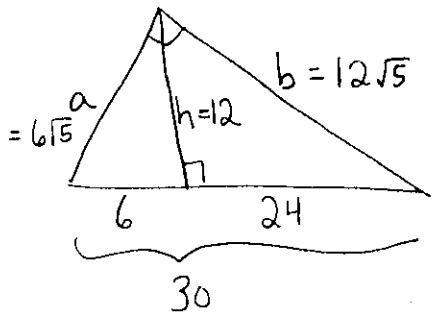
Geometry Team

Answers

1. 250.25
2. 5149
3. 25
4. 0
5. $324\pi \approx 1017.88$
6. 16π
7. $12\pi - 9\sqrt{3} \approx 22.11$
8. E
9. $8\sqrt{3} \approx 13.86$
10. $2 + 8\sqrt{11} \approx 28.53$
11. 6
12. $5j - 10$
13. 76°
14. 12
15. 112°

PCHS Math Invitational

1. $\underline{210 + 18\sqrt{5} \approx 250.25}$



$$\frac{b}{h} = \frac{h}{24}$$

$$h^2 = 144$$

$$h = 12$$

$$6^2 + 12^2 = a^2$$

$$180 = a^2$$

$$a = 6\sqrt{5}$$

$$12^2 + 24^2 = b^2$$

$$b^2 = 720$$

$$b = 12\sqrt{5}$$

Perimeter = $30 + 18\sqrt{5}$

Area = $\frac{1}{2} \cdot 30 \cdot 12 = 180$

$P + A = 210 + 18\sqrt{5} \approx 250.25$

2. $\underline{5149}$

Table of the last # in each row:

1	2	3	4	5	...	n	99
3	7	12	18	25	$\frac{n(n+5)}{2}$	$\frac{99(104)}{2}$	$= 5148$
6	14	24	36	50			
1.6	2.7	3.8	4.9	5.10			

Last # in 99th row is 5148, so the 1st number in the 100th row is 5149.

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3. $\underline{25}$

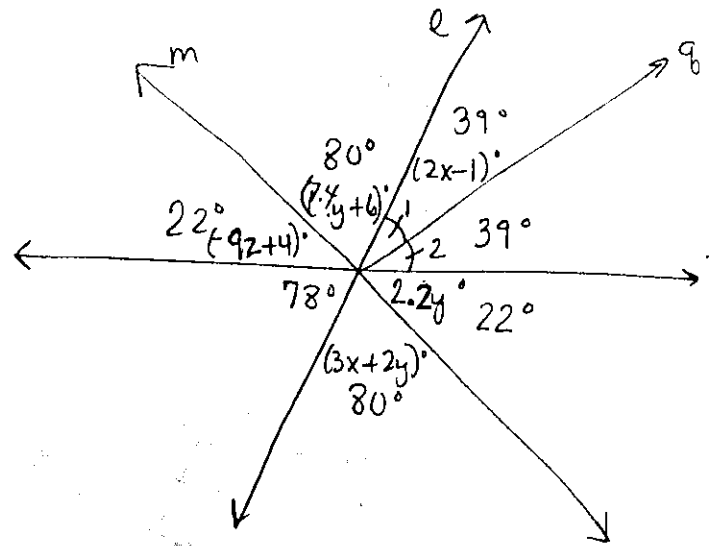
$$24 + 6 + -2 = 28$$

$$2 \begin{matrix} \nearrow 4 \\ \searrow -3 \end{matrix} \quad -2 \begin{matrix} \nearrow 2 \\ \searrow -1 \end{matrix} \quad 2 \begin{matrix} \nearrow 2 \\ \searrow 6 \end{matrix}$$

$$-6 + -4 + -12 = -22$$

$$\left| \frac{-22 - 28}{2} \right| = 25$$

4. $\underline{0}$



$\angle 1$ and $\angle 2$ each = 39° ,
So $2x - 1 = 39$
 $2x = 40$
 $x = 20$

$$7.4y + 6 + 39 + 39 + 2.2y = 180$$

$$9.6y + 84 = 180$$

$$9.6y = 96$$

$$y = 10$$

$$-9z + 4 = 22$$

$$-9z = 18$$

$$z = -2$$

$$\frac{x}{y} + z = \frac{20}{10} - 2 = 2 - 2 = 0$$

5. 324π

$$V = \frac{4}{3}\pi r^3$$

$$\frac{4}{3}\pi r^3 = 972\pi$$

$$r^3 = 729$$

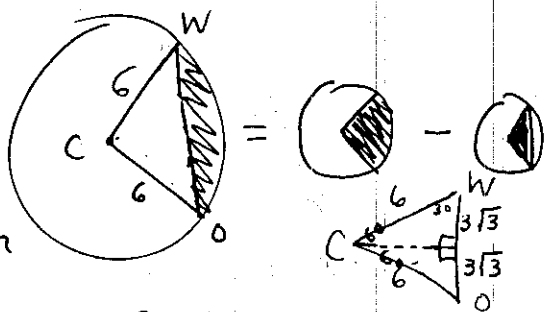
$$r = 9$$

$$\begin{aligned} S.A. &= 4\pi r^2 \\ &= 4\pi \cdot 9^2 \\ &= 324\pi \end{aligned}$$

6. 16π

$$\begin{aligned} A &= \left(\frac{1}{2} \text{side length}\right)^2 \cdot \pi \\ &= \left(\frac{1}{2} \cdot 8\right)^2 \cdot \pi \\ &= 16\pi \end{aligned}$$

7. $12\pi - 9\sqrt{3}$



$$\frac{a}{360}\pi r^2 - \frac{1}{2}bh$$

$$\frac{120}{360} \cdot \pi \cdot 6^2 - \frac{1}{2} \cdot 6\sqrt{3} \cdot 3$$

$$= 12\pi - 9\sqrt{3}$$

8. E

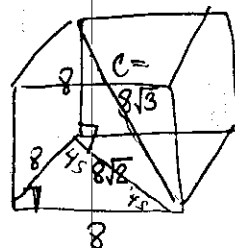
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Rhombus: I, II, III
not IV

9. $8\sqrt{3}$ cm

$$V = 512 \text{ cm}^3$$

$$l, w, h = 8 \text{ cm}$$



$$\begin{aligned} 8^2 + (8\sqrt{2})^2 &= c^2 \\ 64 + 128 &= c^2 \\ 192 &= c^2 \\ 8\sqrt{3} &= c \end{aligned}$$

10. $2 + 8\sqrt{11}$ units

$$A = \pi r^2, C = 2\pi r$$

$$A = C + 175\pi$$

$$\pi r^2 = 2\pi r + 175\pi$$

$$r^2 = 2r + 175$$

$$r^2 - 2r - 175 = 0$$

$$r = \frac{2 \pm \sqrt{4 + 700}}{2}$$

$$= \frac{2 \pm 8\sqrt{11}}{2}$$

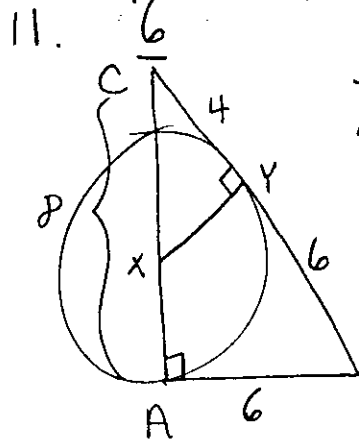
$$= 1 \pm 4\sqrt{11}$$

$$= 1 + 4\sqrt{11} \text{ or } 1 - 4\sqrt{11}$$

$$d = 2r$$

$$= 2(1 + 4\sqrt{11})$$

$$= \underline{2 + 8\sqrt{11}}$$



$\overline{AB} \cong \overline{BY}$ (Tangent Segments)

$\overline{XA} \cong \overline{XY}$ (radii)

$\triangle ABC \sim \triangle YXC$
(AA)

$$\frac{XY}{BA} = \frac{CY}{CA}$$

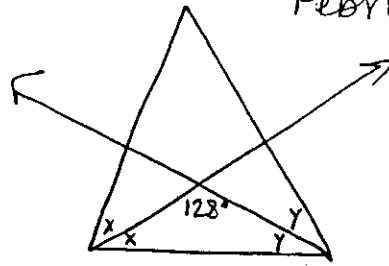
$$\frac{XY}{6} = \frac{4}{8}$$

$$XY = 3 \text{ (radius)}$$

$$\text{diameter} = 6$$

13. 76°

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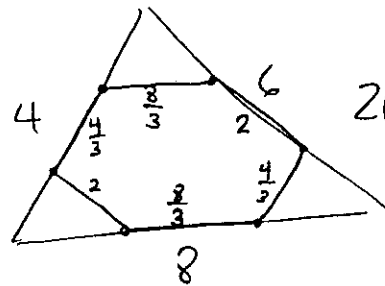


$$x + y = 180 - 128 = 52$$

$$2x + 2y = 2(52) = 104$$

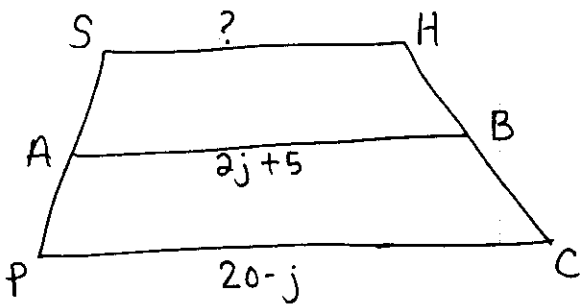
$$180 - 104 = 76$$

14. 12



$$2\left(\frac{4}{3} + \frac{2}{3} + 2\right) = 2(6) = 12$$

12. $5j - 10$



median is the average of the 2 // sides

$$AB = \frac{1}{2}(PC + HS)$$

$$2j + 5 = \frac{1}{2}(20 - j + HS)$$

$$4j + 10 = 20 - j + HS$$

$$5j - 10 = HS$$

15. 112°

base \angle s are \cong :

$$x^2 - 30 = 3x + 10$$

$$x^2 - 3x - 40 = 0$$

$$(x - 8)(x + 5) = 0$$

$$x - 8 = 0 \text{ or } x + 5 = 0$$

$$x = 8 \text{ or } x = -5$$

$$(8^2) - 30 = 34$$

$$3(8) + 10 = 34$$

> base \angle s

$$\text{vertex } \angle : 180 - 2(34)$$

$$= 180 - 68$$

$$= 112^\circ$$