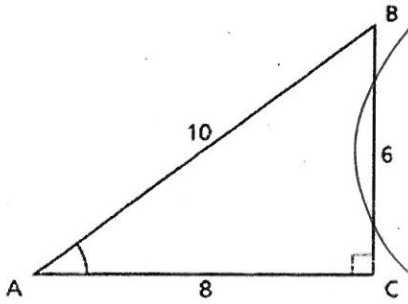
Name:_____ Period:_____

Geometry Final Exam Review Guide

1. Find the missing side length for each set of Pythagorean triples.

3, a, 5	5, 12, b	c, 24, 25	8, 15, d	e, 8, 10
a = 4	b = 13	c = 7	d = 17	e = 6

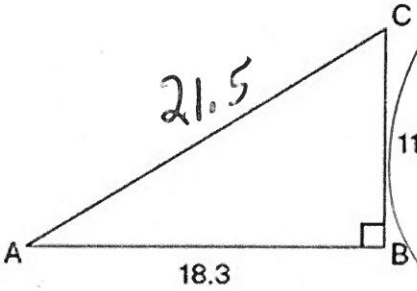
2. Find the sinA, cosA and tanA for each right triangle.



$\sin A = \frac{6}{10} = \frac{3}{5}$

$\cos A = \frac{8}{10} = \frac{4}{5}$

$\tan A = \frac{6}{8} = \frac{3}{4}$

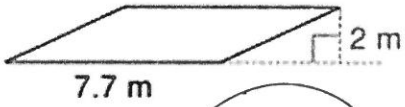


$\sin A = \frac{11.2}{21.5} \approx 0.52$

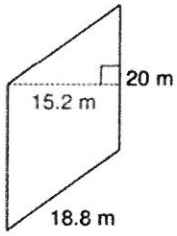
$\cos A = \frac{18.3}{21.5} = 0.85$

$\tan A = \frac{11.2}{18.3}$

3. Find the area of each parallelogram.

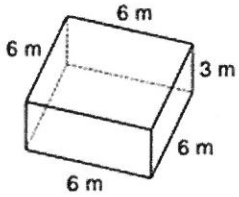


15.4



304

4. Find the surface area of each prism.



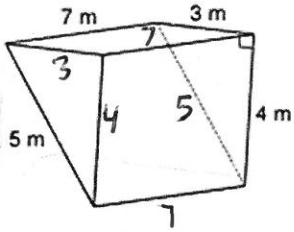
6 | 36 | 2 × 4 = 72

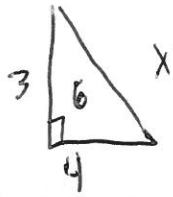
3 | 18 | 4 × 4 = 72

6

~~180~~ m²

144 m²





× 2 = 12

4 | 28 | 7 3 | 21 | 7 5 | 35 | 7

96 m²

5. Given a midpoint and an endpoint, find the other midpoint.

Endpoint (-4, 10) Midpoint(4, 4) (12, -2)

+8 -6 +8 -6

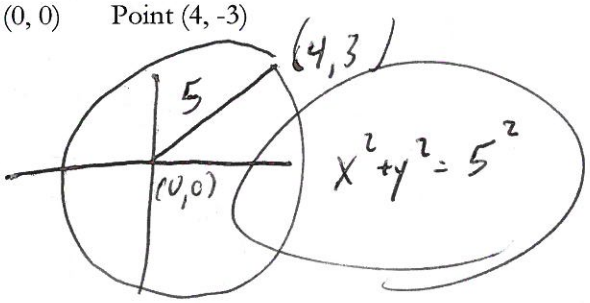
Endpoint (17, 38) Midpoint (0, -4) (-17, -46)

-17 -17

-42 -42

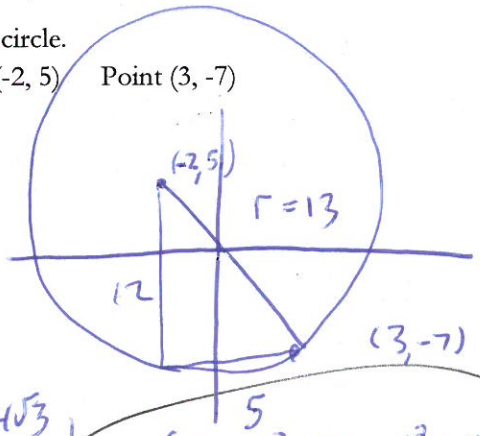
6. Find the equation of the circle that has the given center and point on the circle.

Center (0, 0) Point (4, -3)



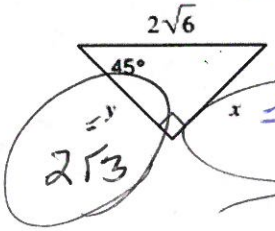
$x^2+y^2=5^2$

Center (-2, 5) Point (3, -7)



$(x+2)^2+(y-5)^2=13^2$

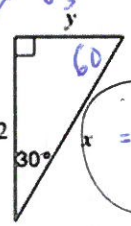
7. Find all missing sides and angles for each special right triangle.



$\div\sqrt{2}$

$y = 2\sqrt{3}$

$x = 2\sqrt{3}$



$\frac{12}{\sqrt{3}} = 4\sqrt{3}$

$x = 8\sqrt{3}$

$k=4$

8. Fill in the blanks given the polygons are similar.

	Polygon 1	Polygon 2	Polygon 3
Perimeter	14	28	56
Area	15	60	250

$k=2$

$k^2=4$

$k=14^2$

9. Fill in the blanks given the solids are similar.

	Solid 1	Solid 2	Solid 3
Surface Area	4	9	25
Volume	8	27	125

$\frac{9}{4}$

$\frac{25}{4}$

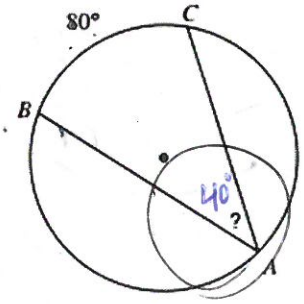
$k^3 = \frac{27}{8}$

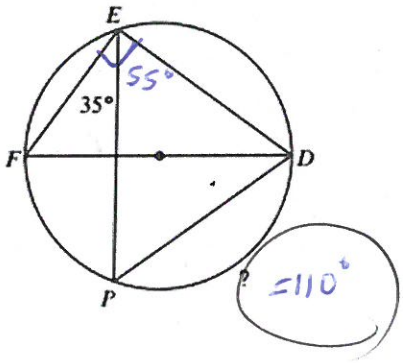
$k = \frac{3}{2}$ $k^2 = \frac{9}{4}$

$k^3 = \frac{125}{8}$

$k = \frac{5}{2}$ $k^2 = \frac{25}{4}$

10. Find the missing angle or arc measure.

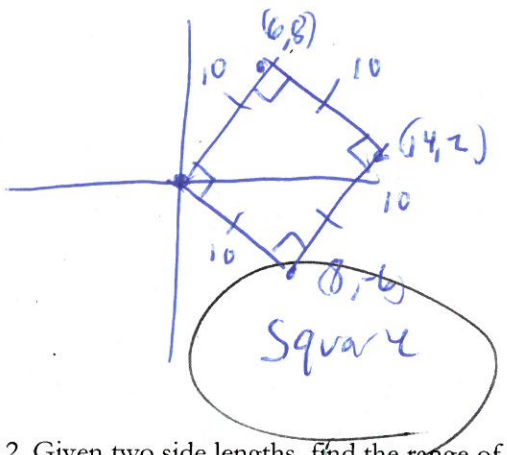




$=110°$

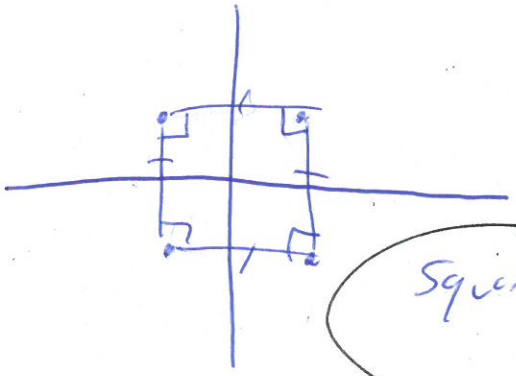
11. Classify each quadrilateral with the most specific name given the coordinates of the vertices.

(0, 0) (6, 8), (14, 2) (8, -6)



Square

(-1, 1) (1, 1) (1, -1) (-1, -1)



Square.

12. Given two side lengths, find the range of possible side lengths for the third side in order to make a triangle.

10, 10

$0 < x < 20$

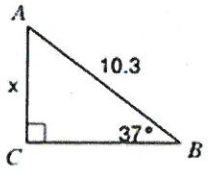
15, 21

$6 < x < 36$

8, 15

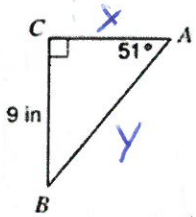
$7 < x < 23$

13. Use SOH-CAH-TOA to find the missing side length.



$\sin 37 = \frac{x}{10.3}$

$x = 6.2$



$\tan 51 = \frac{9}{x}$

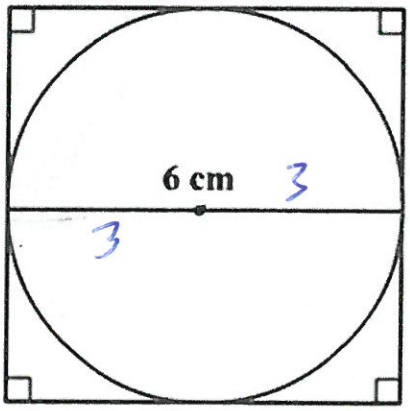
$x = \frac{9}{\tan 51}$

$x = 7.3$

$9^2 + 7.3^2 = y^2$

$y = 11.6$

14. Find the area inside the square, but outside the circle.



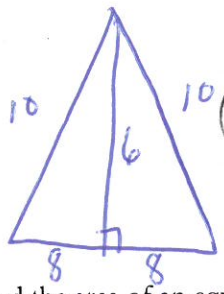
$6^2 - \pi 3^2$

$36 - 9\pi$

7.74

15. Find the area of an isosceles triangle with the given side lengths.

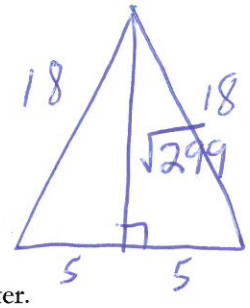
Legs 10, base 16



$\frac{16 \cdot 6}{2}$

$= 48\ u^2$

Legs 18, base 10

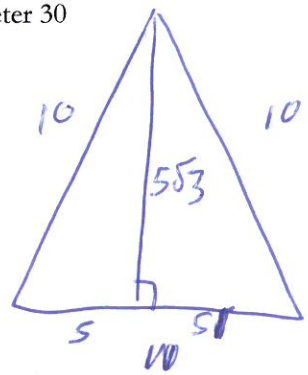


$\frac{10\sqrt{299}}{2}$

$5\sqrt{299}$

16. Find the area of an equilateral triangle with the given perimeter.

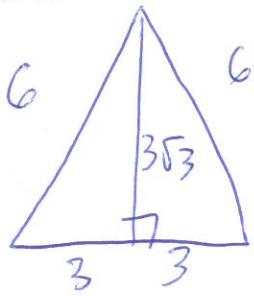
Perimeter 30



$A = \frac{10(5\sqrt{3})}{2}$

$= 25\sqrt{3}\ u^2$

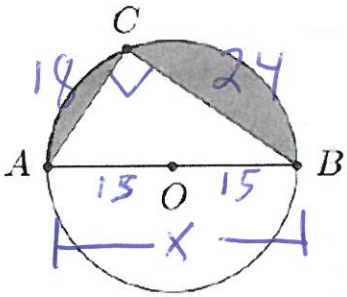
Perimeter 18



$\frac{6(3\sqrt{3})}{2}$

$= 9\sqrt{3}$

17. $\overline{AB}$ is a diameter of circle O. Chord $\overline{AC} = 18$ and chord $\overline{BC} = 24$. Find the area of the shaded region.



$18^2 + 24^2 = x^2$

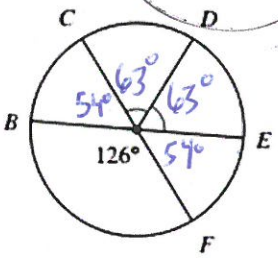
$30 = x$

$\frac{1}{2}\pi 15^2 - \frac{18(24)}{2}$

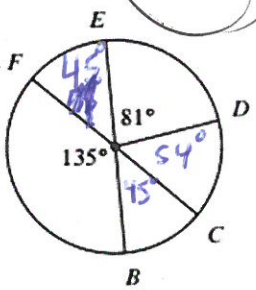
$137.25\ u^2$

18. Find the indicated arc measure.

$m\overline{EFC}$ $= 234^\circ$



$m\overline{CFD}$ $= 306^\circ$



19. Determine whether the side lengths can be used to make a triangle.

100 yds, 100 yds, 1 yd

Yes

$100 + 1 > 100$

1 cm, 2 cm, 3 cm

No

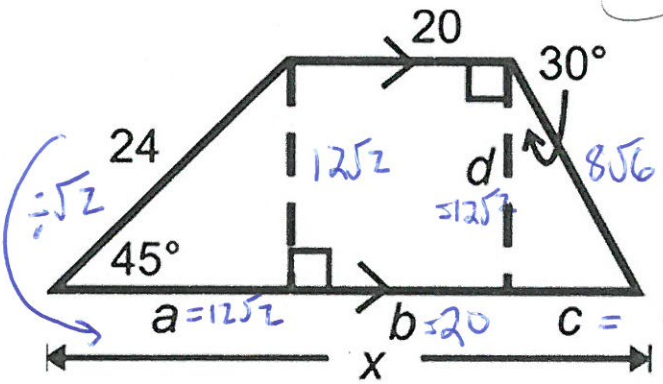
$1 + 2 \not> 3$

14 in, 15 in, 30 in

No

$14 + 15 \not> 30$

20. Find the area of the trapezoid



$\frac{12\sqrt{2}\sqrt{3}}{\sqrt{3}\cdot\sqrt{3}}$ $\frac{12\sqrt{6}}{3} = 4\sqrt{6}$

$A = \frac{(\overset{40}{20 + 20} + 12\sqrt{2} + 4\sqrt{6})\,12\sqrt{2}}{2}$

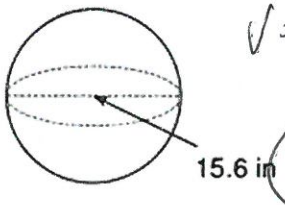
$= \frac{48\sqrt{2} + 288 + 48\sqrt{12}}{2}$

$= 24\sqrt{2} + 144 + 24\sqrt{12}$

$24(\overset{\shortparallel}{2}\sqrt{3})$

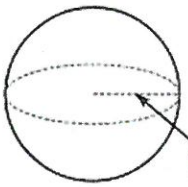
$144 + 24\sqrt{2} + 48\sqrt{3}$

21. Find the volume of each sphere to the nearest inch/cm (not in terms of pi).



$V = \frac{4}{3}\pi\left(\frac{15.6}{2}\right)^3$

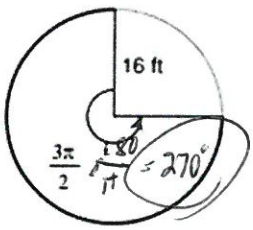
$V = 1987\ in^3$



$V = \frac{4}{3}\pi 7^3$

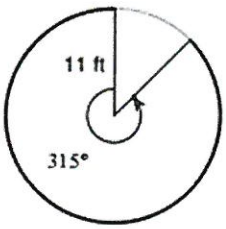
$V = \frac{1372\pi}{3}$

22. Find the length of each arc in terms of pi.



$\frac{270}{360}\,32\pi$

$24\pi\ ft^2$

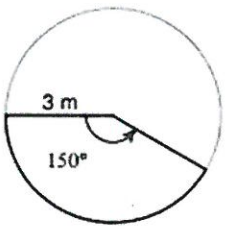


$\frac{315}{360}\cdot 22\pi$

$\frac{7}{8}\cdot 22\pi$

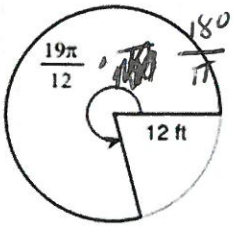
$\frac{77\pi}{4}\ ft^2$

23. Find the area of each sector in terms of pi.



$\pi 3^2 \cdot \frac{150}{360}$

$7.5\pi\ m^2$



$\frac{285°}{360}\cdot 12^2\pi$

$114\pi\ ft^2$

24. Find the area of the circle in terms of pi given the circumference.

C =16π in $= d\pi$

$16 = d$

$8 = r$

$8^2\pi = A = 64\pi \text{ in}^2$

C = 62.8 cm $= d\pi$

$\frac{}{\pi} \quad \frac{}{\pi}$

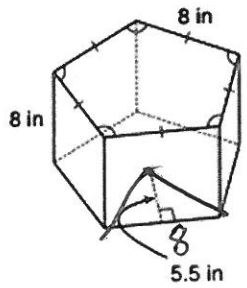
$20 = d$

$10 = r$

$A = 10^2\pi = 100\pi \text{ cm}^2$

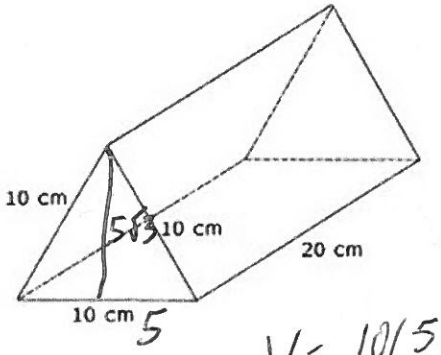
25. Find the volume of each prism.

V = Area of Base · Height



$\left(5\left(\frac{8(5.5)}{2}\right)\right) \cdot 8$

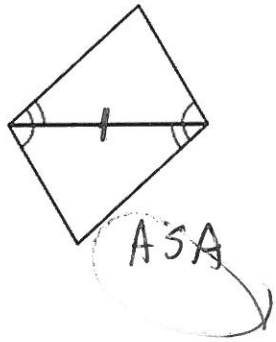
$V = 880 \text{ in}^3$



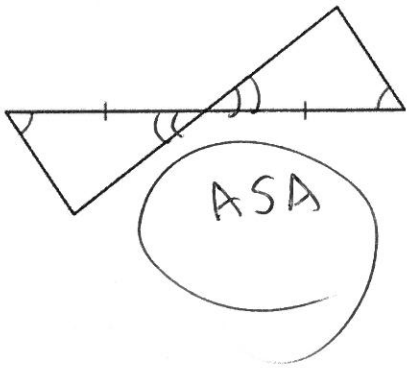
$V = \frac{10(5\sqrt{3})}{2} \cdot 20$

$= 500\sqrt{3} \text{ cm}^3$

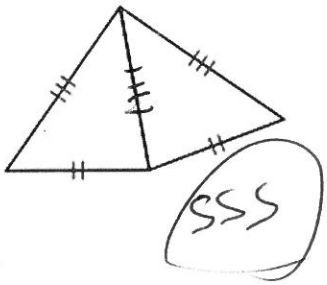
26. State which theorem proves each pair of triangles is congruent.



ASA

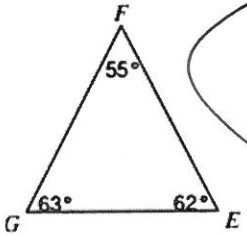


ASA

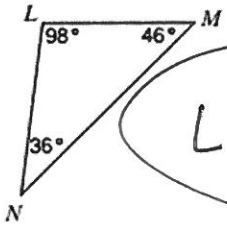


SSS

27. Order the sides from shortest to longest.



GE < GF < FE



LM < LN < NM

28. Given three side lengths of a triangle, classify the triangle by its angles.

6, 9, 13

Scalene

$6^2 + 9^2 < 13^2$

Obtuse

14, 48, 50

Scalene

$14^2 + 48^2 = 50^2$

Right

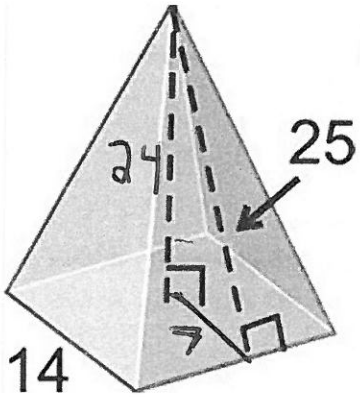
9, 10, 13

Scalene

$9^2 + 10^2 > 13^2$

Acute

29. Find the volume of the square pyramid.



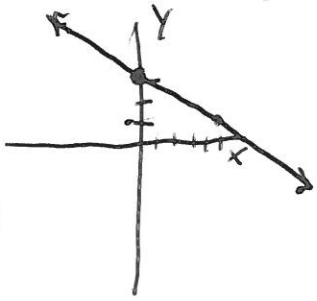
$$\frac{14^2(24)}{3} = 1568\ u^3$$

30. Find the slope, y-intercept and sketch a graph for each equation.

$y = \frac{-2}{5}x + 3$

$m = \frac{-2}{5}$

$b = (0, 3)$



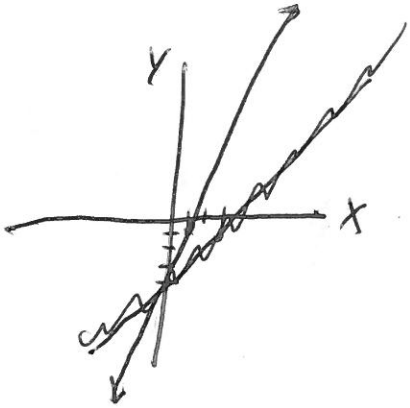
$6x - 2y = 8$

$\frac{6x}{2} - \frac{8}{2} = \frac{2y}{2}$

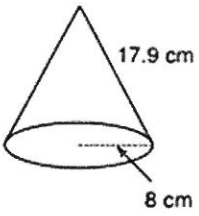
$3x - 4 = y$

$m = 3$

$b = (0, -4)$



31. Find the surface area of each cone.



$\pi r^2 + \pi r l$

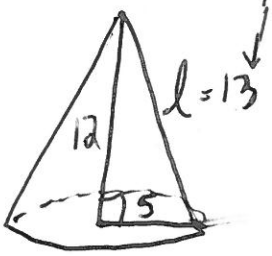
$\pi 8^2 + \pi 8(17.9)$

$64\pi + 143.2\pi$

$207.2\pi\ cm^2$

Diameter 10, Height 12

Pythagorean Thm



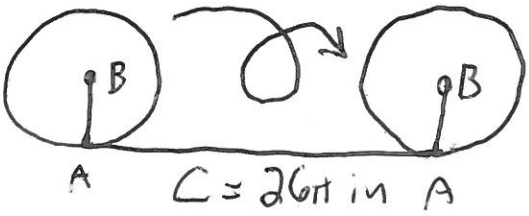
$\pi 5^2 + \pi 5(13)$

$25\pi + 65\pi$

$90\pi\ u^2$

32. How far did a car travel given the wheel has a diameter of 26 inches and made 500 revolutions to the nearest foot?

1 revolution = 1 circumference

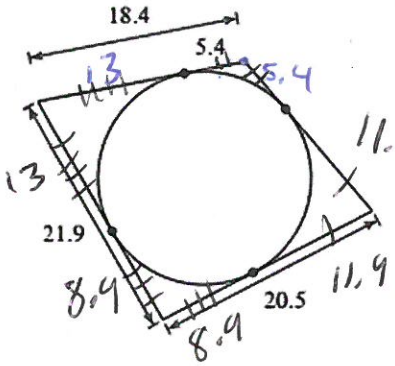


Distance = Circumference × Revolutions

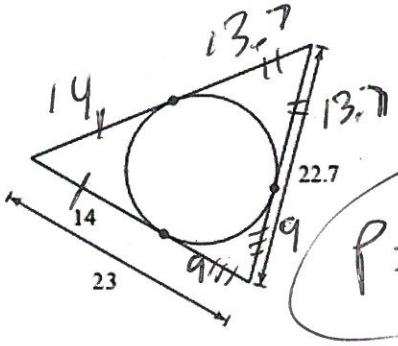
$= 26\pi \cdot 500$

$= 13000\pi$

33. Find the perimeter of each quadrilateral.

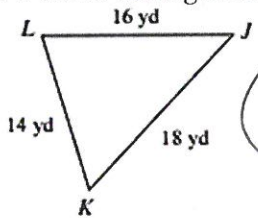


P = 78.4



P = 73.4

34. Order the angles from smallest to largest.

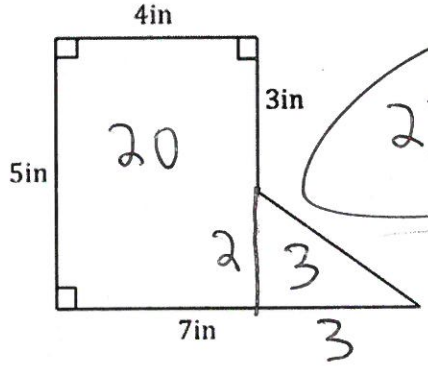


J < K < L

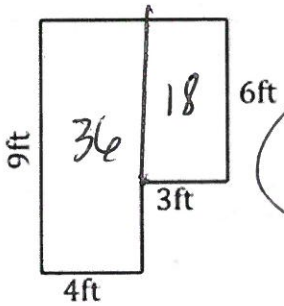
In ΔTUV
$UV = 17$ yd
$TV = 14$ yd
$TU = 9$ yd

V < U < T

35. Find the area.

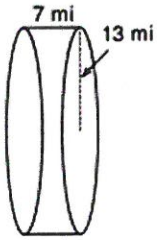


23 in²

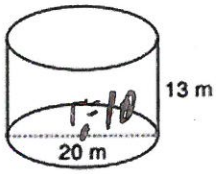


54 ft²

36. Find the surface area of the cylinder in terms of pi.



$SA = 2\pi r^2 + 2\pi r h$
$2\pi 13 + 2\pi(13)(7)$
$26\pi + 182\pi$
208π



$2\pi 10^2 + 2\pi 10(13)$
$200\pi + 260\pi$
460π

37. Write the equation of the line in point-slope form given two points on the line.

$y - y_1 = m(x - x_1)$

(-2, 10) and (2, 2)

$m = \frac{10-2}{-2-2} = \frac{8}{-4} = -2$

$y - 2 = -2(x - 2)$

or

$y - 10 = -2(x + 2)$

(-10, 3) and (8, -3)

$m = \frac{3 - -3}{-10 - 8} = \frac{6}{-18} = -\frac{1}{3}$

$y - 3 = -\frac{1}{3}(x + 10)$

or

$y + 3 = -\frac{1}{3}(x - 8)$

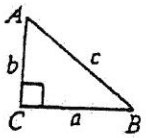
NAME AK DATE

9.2 The Pythagorean Theorem

Objective: State and apply the Pythagorean Theorem.

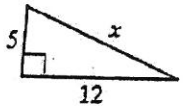
Pythagorean Theorem In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the legs.

If $\angle C$ in $\triangle ABC$ is a right angle, then $a^2 + b^2 = c^2$.

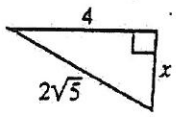


Example 1 Find the value of x. (Remember that the length must be a positive number, so you are only interested in positive roots.)

a.



b.



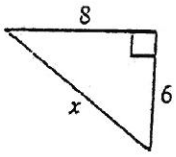
Solution

a. $x^2 = 5^2 + 12^2$
$= 25 + 144 = 169$
$x = \sqrt{169} = 13$

b. $(2\sqrt{5})^2 = x^2 + 4^2$
$20 = x^2 + 16$
$4 = x^2$
$2 = x$

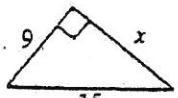
Find the value of x. Give exact answers.

1.



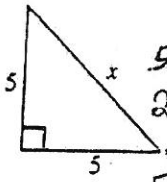
$8^2+6^2=x^2$
$64+36=x^2$
$\sqrt{100}=\sqrt{x^2}$
$10=x$

2.



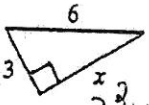
$9^2+x^2=15^2$
$81+x^2=225$
$-81 \quad -81$
$\sqrt{x^2}=\sqrt{144}$
$x=12$

3.



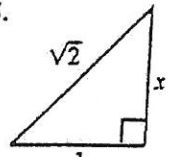
$5^2+5^2=x^2$
$25+25=x^2$
$\sqrt{50}=\sqrt{x^2}$
$\sqrt{25\cdot 2}=x$
$5\sqrt{2}=x$

4.



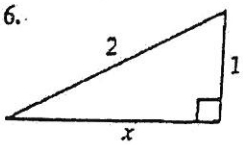
$3^2+x^2=6^2$
$9+x^2=36$
$-9 \quad -9$
$\sqrt{x^2}=\sqrt{27}$
$x=\sqrt{9\cdot 3}$
$x=3\sqrt{3}$

5.



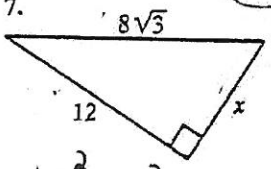
$1^2+x^2=\sqrt{2}^2$
$1+x^2=2$
$-1 \quad -1$
$\sqrt{x^2}=\sqrt{1}$
$x=1$

6.



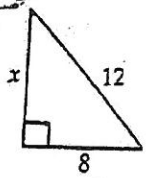
$1^2+x^2=2^2$
$1+x^2=4$
$-1 \quad -1$
$\sqrt{x^2}=\sqrt{3}$
$x=\sqrt{3}$

7.



$12^2+x^2=(8\sqrt{3})^2$
$144+x^2=64\cdot 3$
$144+x^2=192$
$-144 \quad -144$
$\sqrt{x^2}=\sqrt{48}$
$x=\sqrt{16\cdot 3}$
$x=4\sqrt{3}$

8.



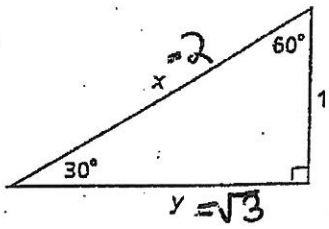
$x^2+8^2=12^2$
$x^2+64=144$
$-64 \quad -64$
$\sqrt{x^2}=\sqrt{80}$
$x=\sqrt{16\cdot 5}$
$x=4\sqrt{5}$

Name_____ Class_____ Date_____

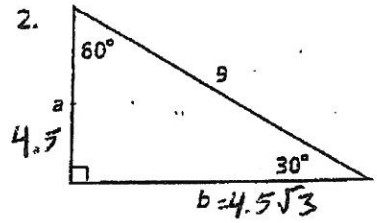
Special Right Triangles

Find the value of each variable. Leave your answers in simplest radical form.

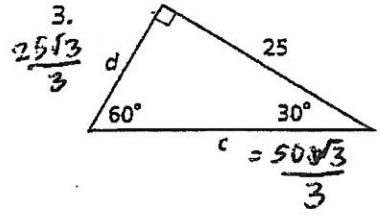
1.



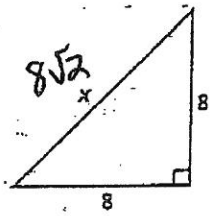
2.



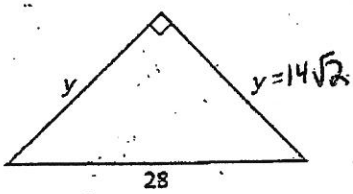
3.



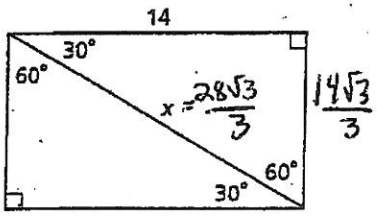
4.



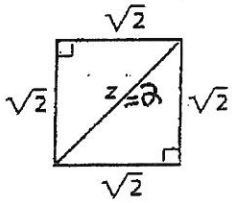
5.



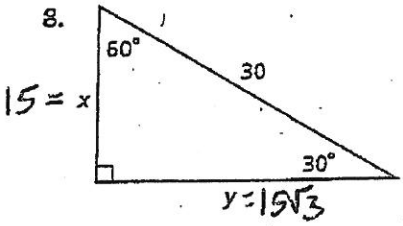
6.



7.



8.



9.