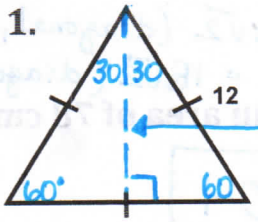
NAME_____ DATE_____ PER.____

A REVIEW OF AREA

Find the area and perimeter of each of the polygons below. EXACT VALUE ONLY.

1.



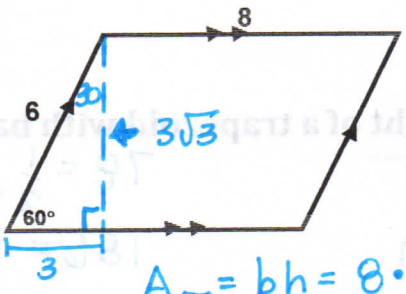
30	60	90
x	$x\sqrt{3}$	2x
6	$6\sqrt{3}$	12

height

$A_\triangle = \frac{bh}{2} = \frac{12 \cdot 6\sqrt{3}}{2} = 36\sqrt{3}\ u^2$

$P_\triangle = 36\ u$

2.

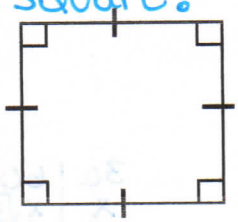


30	60	90
x	$x\sqrt{3}$	2x
3	$3\sqrt{3}$	6

$A_\square = bh = 8 \cdot 3\sqrt{3} = 24\sqrt{3}\ u^2$

$P_\square = 28\ u$

3. Square!



Perimeter = $60\sqrt{5}$

Per: $60\sqrt{5}$

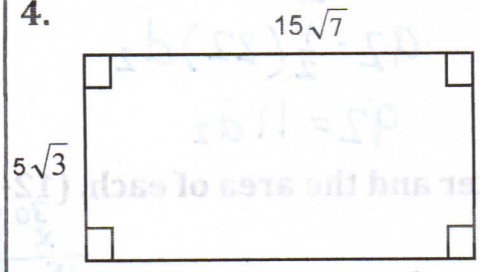
each side: $\frac{60\sqrt{5}}{4}$

$= 15\sqrt{5}$

$AREA_\square = s^2 = (15\sqrt{5})(15\sqrt{5})$

$= 225\sqrt{25} = \boxed{1125\ u^2}$

4.

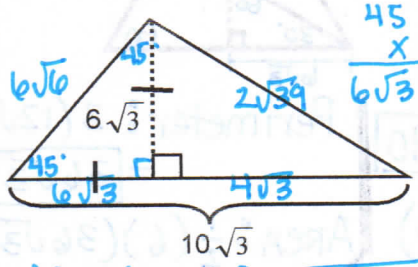


Perimeter: $15\sqrt{7} + 15\sqrt{7} + 5\sqrt{3} + 5\sqrt{3}$

Perimeter = $\boxed{30\sqrt{7} + 10\sqrt{3}}$

AREA: $(5\sqrt{3})(15\sqrt{7}) = \boxed{75\sqrt{21}\ u^2}$

5.



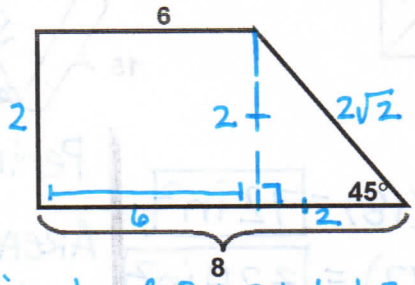
45	45	90
x	x	$x\sqrt{2}$
$6\sqrt{3}$	$6\sqrt{3}$	$6\sqrt{6}$

$(6\sqrt{3})^2 + (4\sqrt{3})^2 = \sqrt{108+48} = \sqrt{156}$ $\boxed{2\sqrt{39}}$

Perimeter: $\boxed{6\sqrt{6} + 10\sqrt{3} + 2\sqrt{39}}$

$AREA_\triangle = \frac{(6\sqrt{3})(10\sqrt{3})}{2} = \frac{60\sqrt{9}}{2} = \boxed{90\ u^2}$

6.



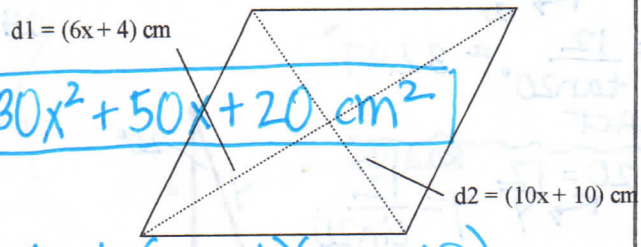
45	45	90
x	x	$x\sqrt{2}$
2	2	$2\sqrt{2}$

Perimeter: $8 + 2 + 6 + 2\sqrt{2} = \boxed{16 + 2\sqrt{2}\ u}$

$AREA_\square = \frac{1}{2}(6+8)(2) = \boxed{14\ u^2}$

Determine the area of the given shape.

7. Rhombus!



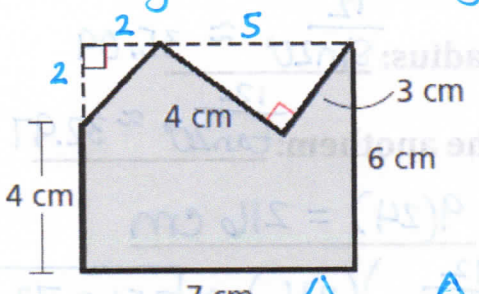
$\boxed{A = 30x^2 + 50x + 20\ cm^2}$

$A = \frac{1}{2}(6x+4)(10x+10)$

$A = \frac{1}{2}(60x^2 + 60x + 40x + 40)$

$\frac{1}{2}(60x^2 + 100x + 40)$

8. Rectangle − 2 triangles!

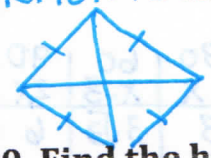


Rectangle $(6)(7) - \frac{2 \cdot 2}{2} - \frac{4 \cdot 3}{2}$

$42 - 2 - 6 = \boxed{34\ cm^2}$

9. One diagonal of a rhombus is three times as long as the other diagonal. The area of the rhombus is 108 square inches. Find the length of each diagonal.

Rhombus $A = \frac{1}{2} d_1 d_2$ $108 = \frac{1}{2}(x)(3x)$ $x = \sqrt{72}$ $36 \cdot 2$



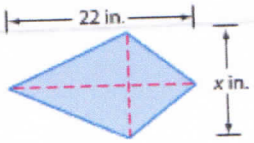
$216 = 3x^2$ $x = 6\sqrt{2}$ (diagonal$_1$)

$72 = x^2$ $6\sqrt{2} \cdot 3 = 18\sqrt{2}$ (diagonal$_2$)

10. Find the height of a trapezoid with bases 6.4 cm and 13 cm, and an area of 78 cm².

Trapezoid $A = \frac{1}{2}(b+b)h$ $78 = \frac{1}{2}(6.4 + 13)h$ $156 = 19.4h$ $\boxed{h = 8.04}$

11. Find x, when the A= 92 in².



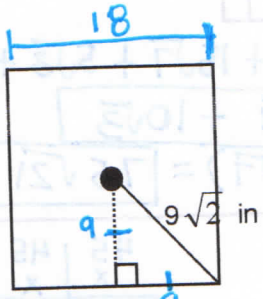
$A = \frac{1}{2} d_1 d_2$ $92 = \frac{1}{2}(22) d_2$ $92 = 11 d_2$ $\boxed{d_2 = 8.36}$

Find the perimeter and the area of each. (12-14). Exact value only.

30	60	90
x	$x\sqrt{3}$	$2x$
6	$6\sqrt{3}$	12

apothem

12.



45	45	90
x	x	$x\sqrt{2}$
9	9	$9\sqrt{2}$

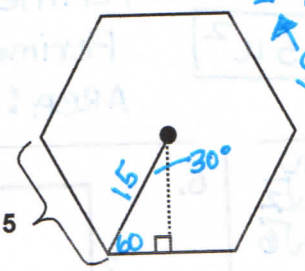
Perimeter: $4(18) = \boxed{72 \text{ in}^2}$

Area: $\frac{1}{2}(9)(72) = \boxed{324 \text{ in}^2}$

13.

30	60	90
x	$x\sqrt{3}$	$2x$
$\frac{15}{2}$	$\frac{15\sqrt{3}}{2}$	15

apothem

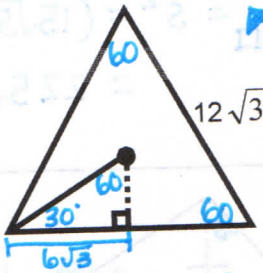


Perimeter: $6(15) = \boxed{90}$

Area: $\frac{1}{2}\left(\frac{15\sqrt{3}}{2}\right)(90)$

$= \boxed{\frac{675}{2}\sqrt{3}}$ or $\boxed{337.5\sqrt{3}}$

14.



Perimeter: $3(12\sqrt{3}) = \boxed{36\sqrt{3} \text{ m}}$

Area: $\frac{1}{2}(6)(36\sqrt{3}) = \boxed{108\sqrt{3} \text{ m}^2}$

15. Use the given shape to find the following, given the side of 24 cm.

*Nonagon

Measure of central angle (θ): 40°

Length of radius: $\frac{12}{\sin 20°} \approx 35.09$

Length of the apothem: $\frac{12}{\tan 20°} \approx 32.97$

Perimeter: $9(24) = 216$ cm

Area: $\frac{1}{2}\left(\frac{12}{\tan 20°}\right)(216) \approx \boxed{3560.73 \text{ cm}^2}$

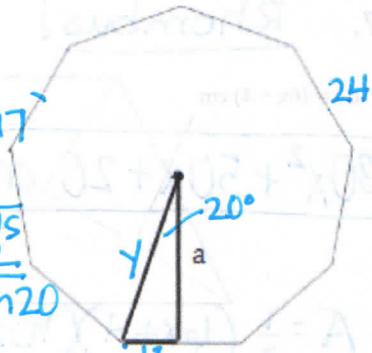
* SOHCAHTOA

$\tan 20° = \frac{12}{a}$

$a = \frac{12}{\tan 20°} \approx 32.97$

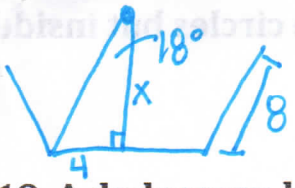
EXACT

$\sin 20 = \frac{12}{y}$ Radius $y = \frac{12}{\sin 20}$



Central $\angle = \frac{360}{9} = 40°$

17. Find the area of a regular decagon with side 8 cm.



Central $\angle = \frac{360}{10} = 36°$

$\tan 18 = \frac{4}{x}$ → apothem

$x = \frac{4}{\tan 18}$

$A = \frac{1}{2}\left(\frac{4}{\tan 18}\right)(10 \cdot 8)$

$A \approx 492.43 \text{ cm}^2$

18. A dodecagon has an area of 2192.4 ft² and a side length of 14 ft, find the apothem.

$A = \frac{1}{2} a P$

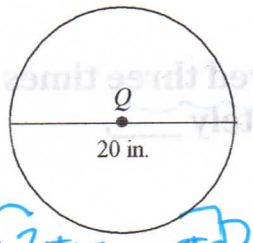
$2192.4 = \frac{1}{2} a (12 \cdot 14)$

$2192.4 = \frac{1}{2} a (168)$

$2192.4 = 84a$

$a = 26.1$

19. Find the area and circumference of ⊙Q in terms of π.



$d = 20$ in

$r = 10$ in

$C = \pi d = 20\pi$ in

$A = \pi (10^2) = 100\pi \text{ in}^2$

$C = 2\pi r$ or πd

$A = \pi r^2$

20. The circumference is 18π in exact value

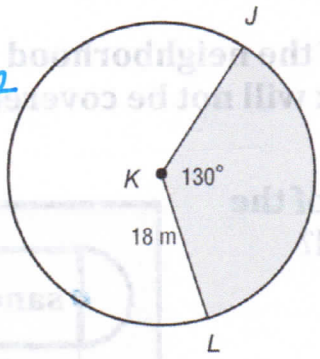
$C = \pi d$

diameter = 18

radius = 9

Find: Area = 81π (πr^2) **Radius: 9**

21. Find (exact value):



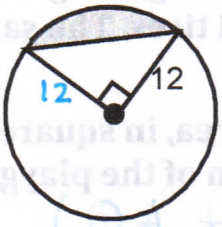
Area of sector: $117\pi \text{ m}^2$

$\pi (18^2)\left(\frac{130}{360}\right) =$

Arc Length: 13π m

$2\pi (18)\left(\frac{130}{360}\right) =$

22. Find the area of the segment.



Area Sector − Area △

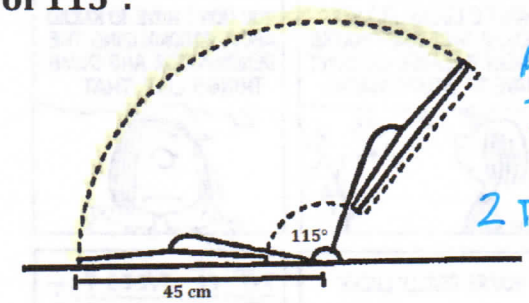
$\pi (12^2)\left(\frac{90}{360}\right) - \frac{12 \cdot 12}{2}$

$36\pi - 72$

EXACT VALUE

Big ⊙ − 2 Small ⊙

23. A windscreen wiper is 45 cm long. In one sweep it turns through an angle of 115°.



Arc length:

$2\pi r\left(\frac{m}{360}\right)$

$2\pi (45)\left(\frac{115}{360}\right)$

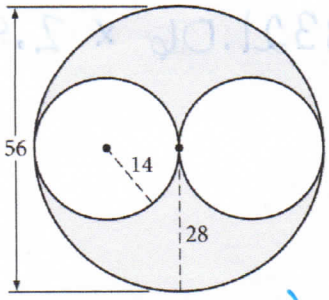
Calculate the arc distance it covers in one sweep. **(nearest hundredth)**

$28.75\pi \approx$

90.32 cm

24. Area of shaded region = _____

$\pi (28^2) - 2(\pi 14^2)$

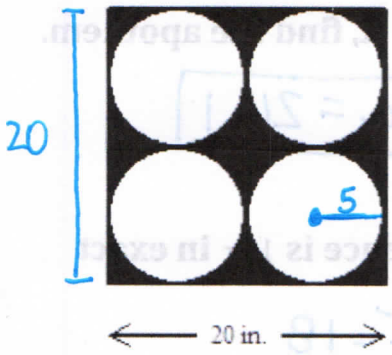


$784\pi - 2(196\pi) =$

$784\pi - 392\pi =$

392π

25. In the figure below, what is the area of the portion outside the circles but inside the square? Express your answer in terms of *p*.



AREA Square $-$ 4 ⊙

$20(20) - 4(\pi 5^2)$

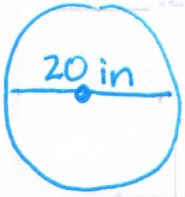
$\frac{20}{2} = 10$ diameter

5 radius

$400 - 100\pi \text{ in}^2$

EXACT VALUE

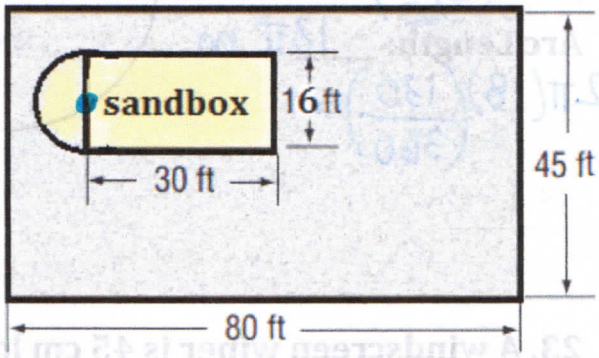
26. An automobile has 20-inch diameter wheels. If the wheels revolved three times after the brakes were applied, the stopping distance was approximately ____.



$C = \pi d = 20\pi \times 3 \approx 188.5 \text{ in}$

27. To promote recycling, the ground of the neighborhood playground shown is being covered by shredded tires. The sandbox will not be covered.

Part A: What is the area, in square feet, of the shredded tire portion of the playground?



$A_{\text{REA}\square} - (A_{\text{REA}_{\text{SMALL}\square}} + A\frac{\odot}{2})$

$(45 \cdot 80) - ((16 \cdot 30) + (\pi \frac{8^2}{2}))$

$3600 - (480 + 32\pi)$

$3120 - 32\pi \approx 3019.47 \text{ ft}^2$

EXACT

Part B: If shredded tires cost $2.99 per square foot, at the required depth, how much will it cost to cover the playground?

$3019.47 \times 2.99 = \$9028.21$