Geometry 22: 10.1-10.5 Extra Practice
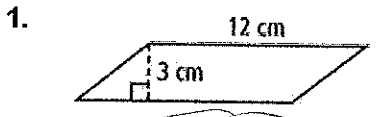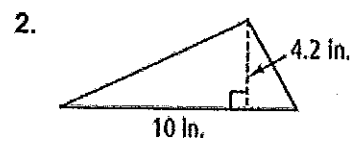
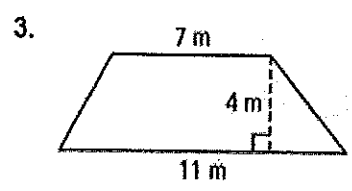Find the area of each figure. Round your answers to the nearest hundredth.

1.

12 cm
3 cm

$A = bh$
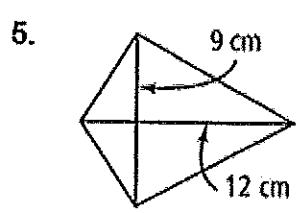$A = (3)(12) = \boxed{36 \text{ cm}^2}$

2.

4.2 in.
10 in.

$A = \frac{1}{2}bh$
$\frac{1}{2}(10)(4.2)$
$\boxed{21 \text{ in}^2}$

3.

7 m
4 m
11 m

$A = \frac{1}{2}h(b_1 + b_2)$
$\frac{1}{2}(4)(7+11)$
$A = \boxed{36 \text{ m}^2}$

4.

6 ft   5.5   6
5.5 ft
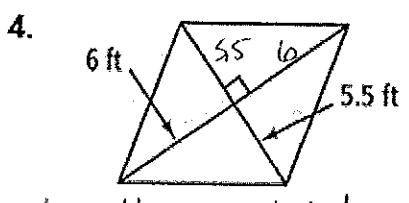
$d_1 = 11$
$d_2 = 12$
$A = \frac{1}{2}d_1 d_2$
$\frac{1}{2}(11)(12)$
$\boxed{66 \text{ ft}^2}$

5.

9 cm
12 cm

$A = \frac{1}{2}d_1 d_2$
$\frac{1}{2}(9)(12)$
$\boxed{54 \text{ cm}^2}$
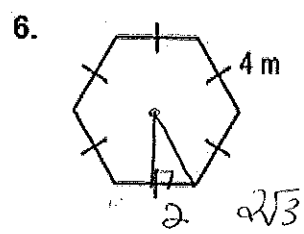
6.

4 m
2   2√3   30   60
2
5

$P = 4.6$
$\boxed{24}$

$A = \frac{1}{2}ap$
$\frac{1}{2}(2\sqrt{3})(24) = \boxed{24\sqrt{3} \text{ m}^2}$
$\approx \boxed{41.57 \text{ m}^2}$
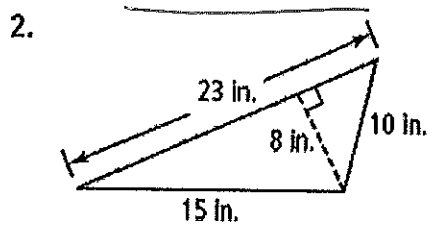
7.

$8\sqrt{3}$ m   30   60   16   s   5√3

$5\sqrt{3} = 8\sqrt{3}$
$S = 8$

$a = 8\sqrt{3}$
$P = 16(8) = 128 \; 96$
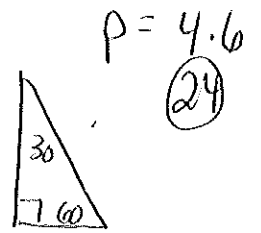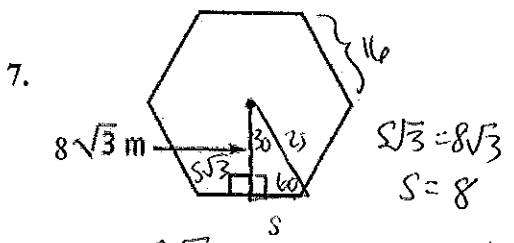
$A = \frac{1}{2}(8\sqrt{3})(96)$
$384\sqrt{3} \approx \boxed{665.11 \text{ m}^2}$

Find the area of each figure. Leave your answer in simplest radical form.

1.

20 m
3 m

$A = bh$
$20(3) = \boxed{60 \text{ m}^2}$

2.

23 in.   8 in.   10 in.
15 in.

$A = \frac{1}{2}bh$
$\frac{1}{2}(23)(8)$
$\boxed{92 \text{ in}}$

3.

20 in.   6 in.   60°
$6\sqrt{3}$ 30
14 in.
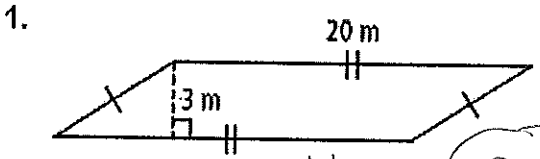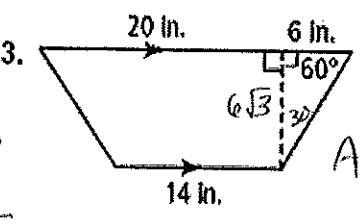
$b_1 = 26$
$b_2 = 14$
$h = 6\sqrt{3}$

$A = \frac{1}{2}h(b_1 + b_2)$
$A = \frac{1}{2}(6\sqrt{3})(40)$
$\boxed{120\sqrt{3} \text{ in}^2}$
≈ 207.85

4.

7.5 in.   8 in
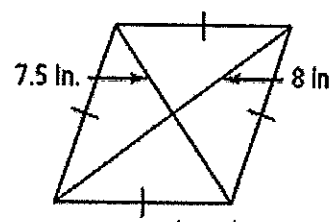
$A = \frac{1}{2}d_1 d_2$
$A = \frac{1}{2}(16)(15)$
$\boxed{120 \text{ in}^2}$

$d_1 = 16$
$d_2 = 15$

Find the area of each regular polygon. Round your answer to the nearest tenth.

5.

2.8 in.   4 in.

$p = 4.5$
20

$A = \frac{1}{2}ap$

$\frac{1}{2}(2.8)(20)$

$\boxed{28 \text{ in}^2}$

6.

20 cm

$10\sqrt{3}$

10

$a = 10\sqrt{3}$

$P = 100 = 20(6)$

$A = \frac{1}{2}(10\sqrt{3})(120)$

$600\sqrt{3} \approx \boxed{1039.2 \text{ cm}^2}$

7.

6 ft

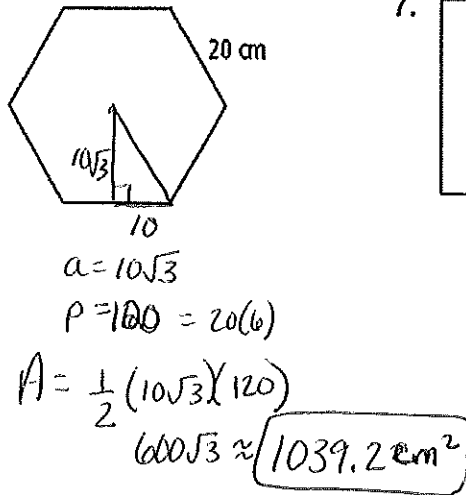12

$p = 12 \cdot 4$
48

6

$A = \frac{1}{2}ap$

$A = \frac{1}{2}(6)(48)$

$\boxed{144 \text{ ft}^2}$
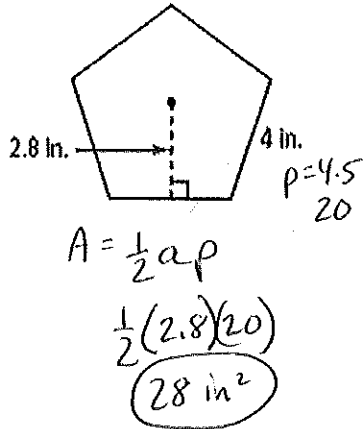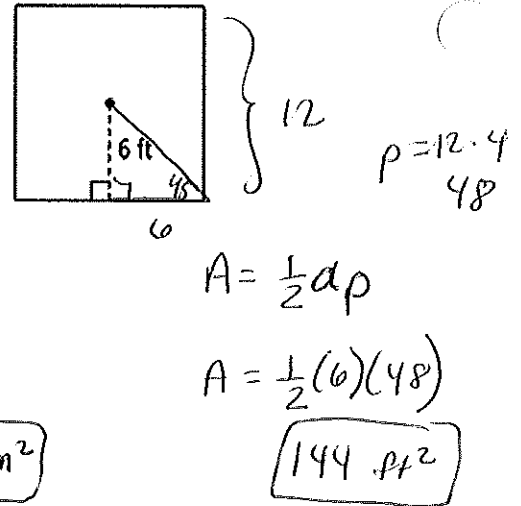
8. An equilateral triangle has a perimeter of 48 cm. What is its area?

16   30   16
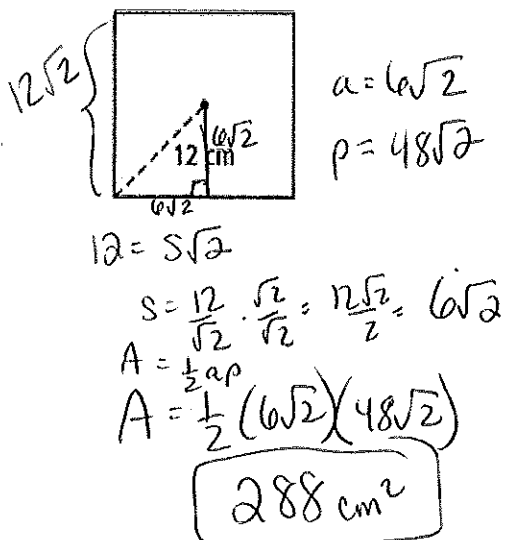$8\sqrt{31}$
60
16   8
cm

$P = 48$

$S = \frac{48}{3} = 16$
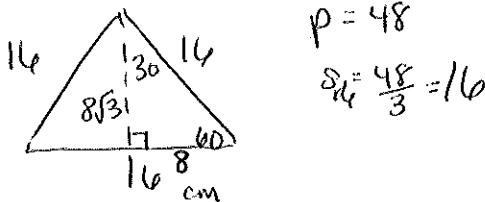
$A = \frac{1}{2}bh$

$\frac{1}{2}(16)(8\sqrt{3})$

$\boxed{64\sqrt{3} \text{ cm}^2 \approx 110.85 \text{ cm}^2}$

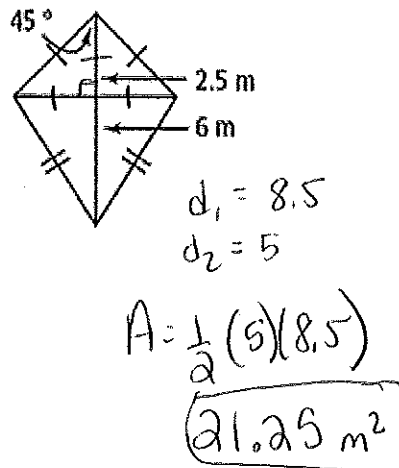**9.** What is the area of a circle with a circumference of 18π in.? Leave your answer in terms of π.

$C = 2\pi r$

$\frac{18\pi}{2\pi} = \frac{2\pi r}{2\pi}$

$9 = r$

$A = \pi r^2$

$A = \pi(9^2)$

$\boxed{81\pi \text{ in}^2}$

10. Find the area of each of the given diagrams below. Round your answers to the nearest hundredth.

a.

$12\sqrt{2}$

$6\sqrt{2}$
12 cm
$6\sqrt{2}$

$12 = S\sqrt{2}$

$S = \frac{12}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{12\sqrt{2}}{2} = 6\sqrt{2}$

$a = 6\sqrt{2}$
$p = 48\sqrt{2}$

$A = \frac{1}{2}ap$

$A = \frac{1}{2}(6\sqrt{2})(48\sqrt{2})$

$\boxed{288 \text{ cm}^2}$

b.

45°
2.5 m
6 m

$d_1 = 8.5$
$d_2 = 5$

$A = \frac{1}{2}(5)(8.5)$

$\boxed{21.25 \text{ m}^2}$

c.

10
6 m
10 m   12 m

$A = \frac{1}{2}h(b_1 + b_2)$

$A = \frac{1}{2}(6)(10 + 22)$

$3(32)$

$\boxed{96 \text{ m}^2}$

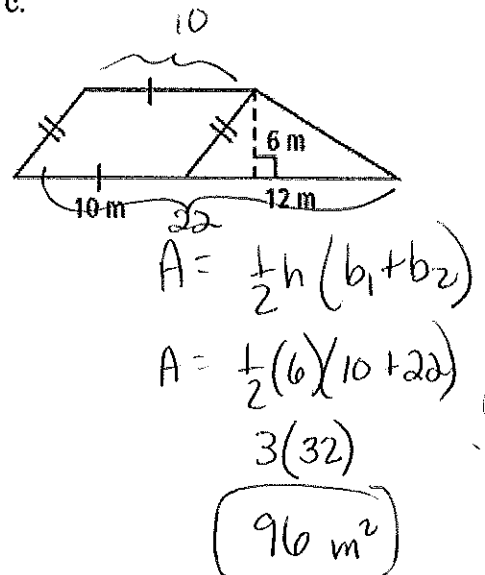**What is the area of each figure below? Round to the nearest tenth.**

1.

10 m / 5 m / 4 m

$A = bh = \boxed{40 \ m^2}$

2.

8 in. / 12 in.

$A = \frac{1}{2}bh$

$\frac{1}{2}(12)(8)$

$\boxed{48 \ in^2}$

3.

3.5 cm / 4 cm
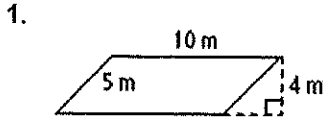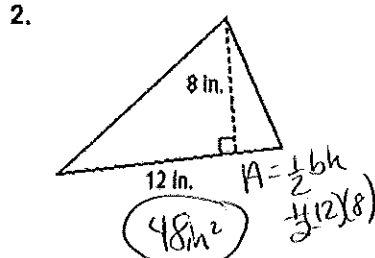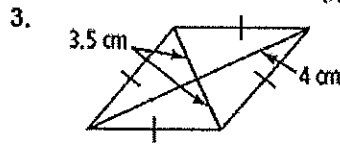
$d_1 = 7 \quad d_2 = 8$

$A = \frac{1}{2}d_1 d_2$

$A = \frac{1}{2}(7)(8)$

$\boxed{28 \ cm^2}$

4.

9 ft / 5 ft / 13 ft

$A = \frac{1}{2}h(b_1 + b_2)$

$\frac{1}{2}(5)(13+9)$
    22

$\boxed{55 \ ft^2}$

5.

4.5 m / 3 m / 3 m / 7.5 m

$d_1 = 4.5 + 7.5$
    12
$d_2 = 6$
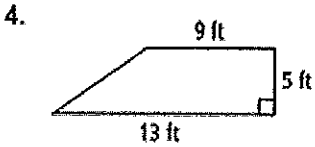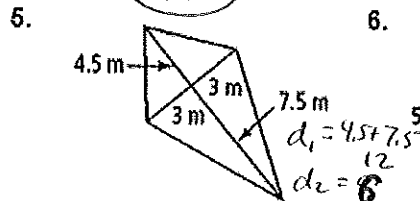
$A = \frac{1}{2}d_1 d_2$

$\frac{1}{2}(12)(6) = \boxed{36 \ m^2}$

6.
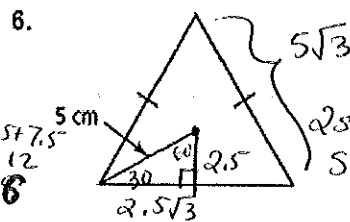
$5\sqrt{3}$ / 5 cm / 30 / 2.5 / $2.5\sqrt{3}$

$2s = 5$
$S = 2.5$

$a = 2.5$
$p = 15\sqrt{3}$

$A = \frac{1}{2}(2.5)(15\sqrt{3})$

$\boxed{32.48 \ cm^2}$

7. A trapezoid has an area of 91 m². The height of the trapezoid is 7 m and the measure of one base is twice the height. What is the measure of the other base of the trapezoid?

$A = 91 \quad h = 7 \quad b_1 = 2(7) = 14$

$A = \frac{1}{2}h(b_1 + b_2)$

$91 = \frac{1}{2}(7)(14 + b_2)$

$\frac{91}{3.5} = \frac{3.5(14 + b_2)}{3.5}$

$26 = 14 + b_2$
   $-14 \quad -14$

$\boxed{12 = b_2}$

8. The base of a triangle is 2 more than twice the height of the triangle. Find the measure of the base and the height if the area is 20 ft.²

$\rightarrow b = 2h + 2$

$A = \frac{1}{2}bh \quad A = 20$
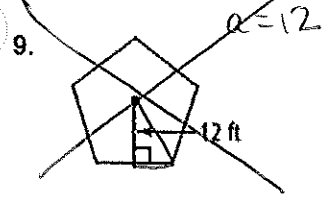
$20 = \frac{1}{2}(2h+2)(h)$

$40 = (2h+2)h$

$\frac{40}{2} = \frac{2h^2 + 2h}{2}$

$20 = h^2 + h$

$0 = h^2 + h - 20$

$(h-4)(h+5)$

$\boxed{h = 4}$

Find the area of each regular polygon. Round to the nearest tenth.

9.

$a = 12$ / 12 ft

10.

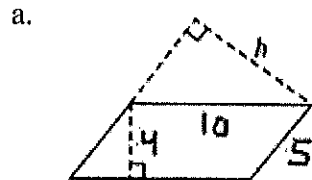$\boxed{93.5 \ mm^2}$

$2s = 6$
$S = 3$
$a = 3\sqrt{3}$

6 mm
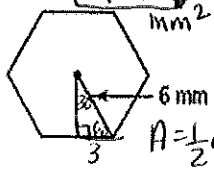
$A = \frac{1}{2}ap$

$\frac{1}{2}(3\sqrt{3})(36)$
$54\sqrt{3}$

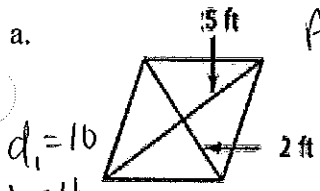**11.** Find the value of h for each parallelogram below.

a.

h / 10 / 4 / 5

$4(10) = 5h$
$40 = 5h$
$\boxed{h = 8}$

b.

9 / h / 7 / 6
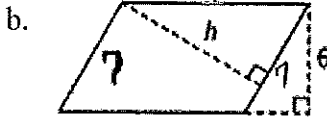
$9(6) = 7h$
$\frac{54 = 7h}{7 \quad 7}$
$\boxed{h = 7.71}$

12. Find the area of each rhombus.

a.

5 ft / 2 ft

$d_1 = 10$
$d_2 = 4$

$A = \frac{1}{2}d_1 d_2$

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

$\boxed{20 \ ft^2}$

b.

6 m / x / 6 / 4 m

$d_1 = 8$
$d_2 = 4\sqrt{5}$
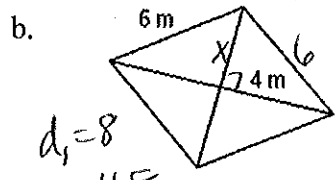
$x^2 + y^2 = 6^2$
$x^2 = 36 - 16$
$x^2 = 20$
$x = \sqrt{20} = 2\sqrt{5}$

$A = \frac{1}{2}(8)(4\sqrt{5}) = 16\sqrt{5} \approx \boxed{35.78 \ m^2}$

13. Find the area of each regular polygon with the given apothem a and side length s.

a. pentagon, $a = 4.9$ in., $s = 7.1$ in.

$a = 4.9$ $A = \frac{1}{2}ap$

$p = (7.1)(5)$ $A = \frac{1}{2}(4.9)(35.5)$
$\quad 35.5$

$\boxed{86.98 \text{ in}^2}$

b. hexagon, $a = 12.1$ ft, $s = 14$ ft
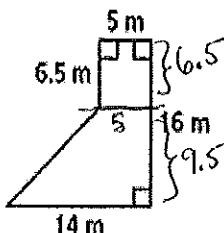
$a = 12.1$ $A = \frac{1}{2}ap$

$p = (14)(6)$ $\frac{1}{2}(12.1)(84)$
$\quad 84$

$\boxed{508.2 \text{ ft}^2}$

14. Find the area of the composite figures below.

a.

$16 - 6.5 = 9.5$

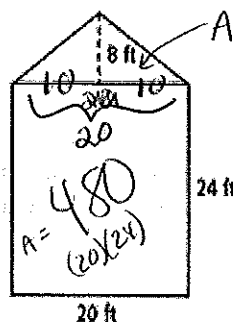(or rect. + triangle)

$A_{rect} + A_{trap} = A_{total}$

$bh \quad + \quad \frac{1}{2}h(b_1 + b_2)$

$(5)(6.5) + \frac{1}{2}(9.5)(5 + 14)$
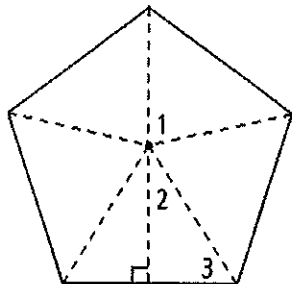
$32.5 + 90.25$

$\boxed{122.75 \text{ m}^2}$

b.

$A = \frac{1}{2}bh = \frac{1}{2}(20)(8) = 80$

$A = \frac{}{(20)(24)} = 480$

$A = 480 + 80$

$\boxed{560 \text{ ft}^2}$

15. Each regular polygon below has a radii and apothem as shown. Find the measure of each numbered angle.
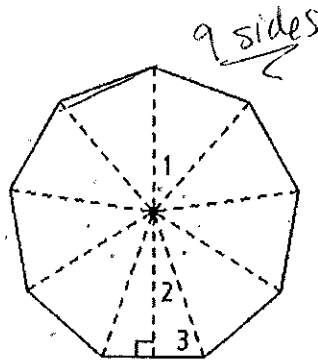
a.

$m\angle 1 = \frac{360}{5} = \boxed{72°}$

$m\angle 2 = \frac{72}{2} = \boxed{36°}$

$m\angle 3 = 90 - 36 = \boxed{54°}$

b.

9 sides

$m\angle 1 = \frac{360}{9} = \boxed{40°}$

$m\angle 2 = \frac{40}{2} = \boxed{20°}$

$m\angle 3 = 90 - 20 = \boxed{70°}$

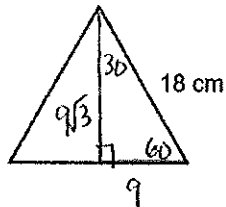**16.** Find the area of each regular polygon. Keep your answers exact (as radicals).

a.
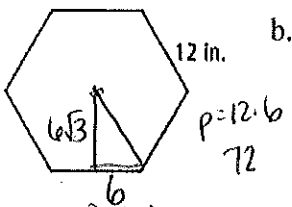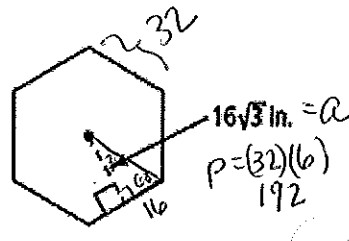
12 in.

$6\sqrt{3}$

$p = 12 \cdot 6$
$\quad 72$

$A = \frac{1}{2}(6\sqrt{3})(72)$

$\boxed{216\sqrt{3} \text{ in}^2}$
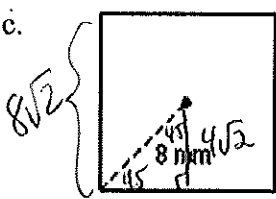
b.

30   18 cm

$9\sqrt{3}$ 60

9

$A = \frac{1}{2}bh$

$\frac{1}{2}(18)(9\sqrt{3})$

$\boxed{81\sqrt{3} \text{ cm}^2}$

c.

$8\sqrt{2}$

$4\sqrt{2}$
8 mm   45

$s\sqrt{2} = 8$

$s = 4\sqrt{2}$ $\boxed{128 \text{ mm}^2}$

$A = \frac{1}{2}ap$

$\frac{1}{2}(4\sqrt{2})(32\sqrt{2})$

d.

32

$16\sqrt{3}$ in. $= a$

$p = (32)(6)$
$\quad 192$

16

$A = \frac{1}{2}(16\sqrt{3})(192)$

$\boxed{1536\sqrt{3} \text{ in}^2}$

17. If the area of a parallelogram is 224 in² and the height is 14 in, what is the base?

$$A = bh$$
$$224 = b(14)$$
$$\boxed{b = 16 \text{ in}}$$

18. If the area of a trapezoid is 108 m². It has a base 15 m and the other base is 12 m. What is the height?

$$A = 108 \qquad b_1 = 15 \qquad b_2 = 12$$

$$A = \tfrac{1}{2}h(b_1 + b_2)$$
$$108 = \tfrac{1}{2}(h)(15 + 12)$$
$$216 = 27h \qquad \boxed{h = 8 \text{ m}}$$

19. If the area of a triangle is 143 in². It has a base 22 in. What is the height?
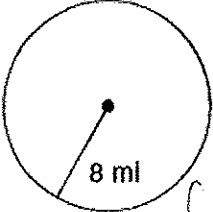
$$A = 143 \qquad b = 22$$

$$A = \tfrac{1}{2}bh$$
$$143 = \tfrac{1}{2}(22)h \qquad \boxed{h = 13 \text{ in}}$$
$$143 = 11h$$

20. Find the circumference and area of each. Leave answers in exact terms AND rounded to nearest tenth.

a.

8 mi

$$C = 2\pi r$$
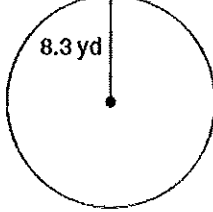$$2\pi(8)$$
$$C = \boxed{16\pi \approx 50.3 \text{ mi}}$$
$$A = \text{exact} = \boxed{64\pi \approx 201.1}$$
$$\pi r^2$$

b.

8.3 yd

$$C = 16.6\pi \approx 52.2$$
$$\text{exact} = 68.89\pi \approx 216.4$$

c. diameter = 14 m

$$r = 7$$
$$C = 14\pi \approx 44.0$$
$$\text{exact} = 49\pi \approx 153.9$$

g. diameter = 21.3 in

$$r = 10.65$$
$$C = 21.3\pi \approx 66.9$$
$$\text{exact} = 113.42\pi \approx 356.3$$

21. Find the radius of each circle:

a. Area = 64π in²

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

b. Circumference = 84π ft

$$84\pi = 2\pi r$$
$$\boxed{42 = r}$$

22. Find the circumference of the circle. Leave your answer in terms of π.

a. area = 64π mi²

$$64\pi = \pi r^2$$
$$r = 8$$
$$\boxed{C = 16\pi}$$

b. area = 36π mi²

$$36\pi = \pi r^2$$
$$36 = r^2$$
$$r = 6$$
$$\boxed{C = 12\pi}$$

23. Find the area of each circle. Leave your answer in terms of π.

a. circumference = 22π in
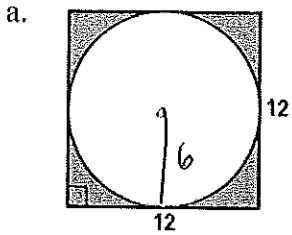
$$22\pi = 2\pi r$$
$$11 = r$$
$$\boxed{A = 121\pi}$$

b. circumference = 10π in

$$10\pi = 2\pi r$$
$$5 = r$$
$$\boxed{A = 25\pi}$$

24. Find the area of the shaded regions.

a.

12

6

12

b.

4 In.

4 In.

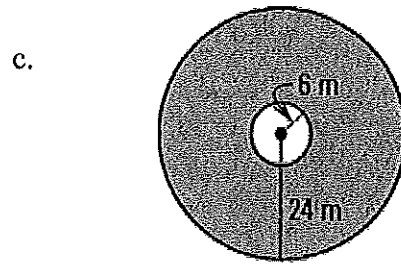2

c.

6 m

24 m

$A_{sq} = 144$

$- A_\theta = 36\pi \approx 113.1$

$A_{shaded} = \boxed{30.9}$
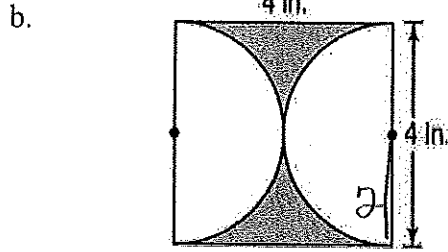
$A_{sq} = 16$

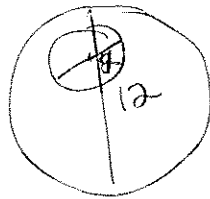$- A_\theta = 4\pi \approx 12.6$

$\boxed{A_{sh} = 3.4 \, in^2}$

$A_{\theta r=24} = 576\pi$

$- A_{\theta r=6} = 36\pi$

$\boxed{540\pi \, m^2}$

$\boxed{\approx 1696.5 \, m^2}$

25. Charlie has a circular carpet in his drawing room. He wants to put a table in middle of the carpet. The diameter of the carpet is 12 meters and the diameter of the table is 4 meters. Calculate how much area of carpet is left after putting table the table in the place. Leave your answer in terms of π.

12

$A_{r=6} = 36\pi$

$A_{r=2} = 4\pi$

$\boxed{32\pi \, m^2}$

26. Maya makes a round pizza. She wants to put a cheese layer on the pizza. If the flattened pie dough is 8 cm in diameter, how many square cm of cheese layer does she need to put on the pizza? Round your final answer to the nearest hundredth.

$r = 4$

$A = 16\pi$

$\boxed{50.27 \, cm^2}$