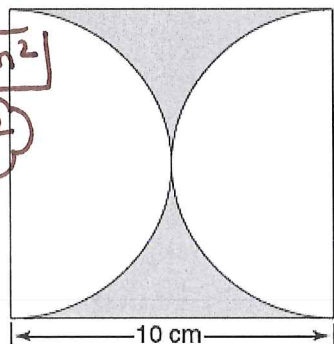NAME _Key_   DATE _____

Area of Shaded Region Worksheet

Find the area of the shaded region in each of the following figures.

Need exact and rounded for any circle question.

① $10 \cdot 10 - 2\frac{1}{2}\pi 5^2$

$A = 100 - 25\pi \ cm^2$

$A \approx 21.5 cm^2$

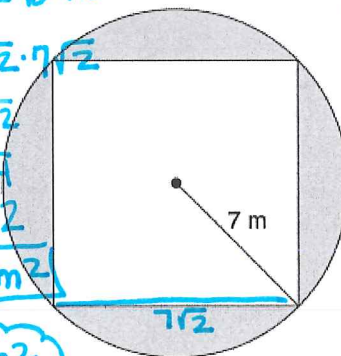② $A = \pi r^2 - b \cdot h$

$A = \pi 7^2 - 7\sqrt{2} \cdot 7\sqrt{2}$

$A = 49\pi - 7 \cdot 7\sqrt{2 \cdot 2}$

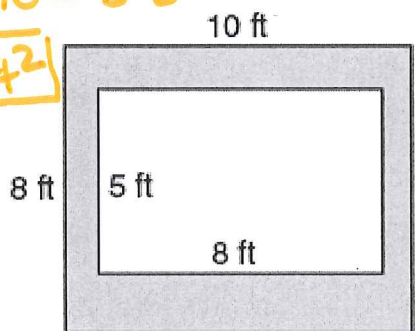$A = 49\pi - 49 \cdot \sqrt{4}$

$A = 49\pi - 49 \cdot 2$
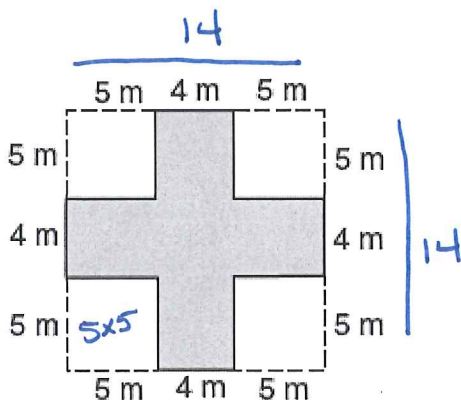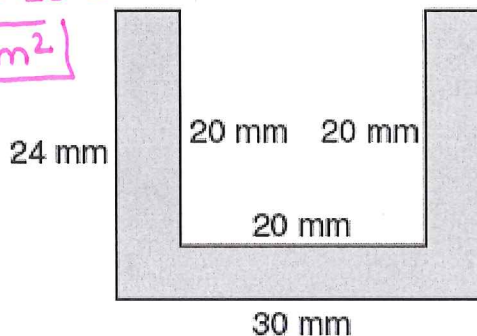
$A = 49\pi - 98 \ m^2$

$A \approx 55.9 \ m^2$

7 m

$7\sqrt{2}$

③ $A = 8 \cdot 10 - 5 \cdot 8$

$A = 40 \ ft^2$

10 ft

8 ft   5 ft

8 ft

④ $A = 24 \cdot 30 - 20 \cdot 20$

$A = 320 \ mm^2$

24 mm   20 mm   20 mm

20 mm

30 mm

14

5 m   4 m   5 m

5 m   5 m

4 m   4 m   14

5 m   5×5   5 m

5 m   4 m   5 m

⑤ $A = 14 \cdot 14 - 4(5 \cdot 5)$

$A = 96 \ m^2$

10 cm

10 cm
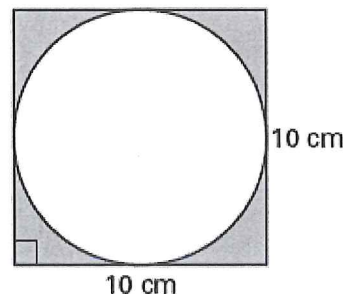
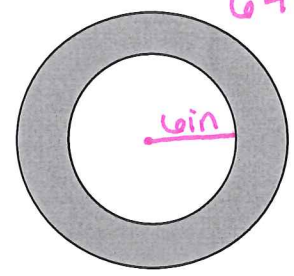⑥ $A = 10 \cdot 10 - \pi 5^2$

$A = 100 - 25\pi \ cm^2$

$A \approx 21.5 cm^2$

⑦ This figure consists of 2 concentric circles. If the shaded area is 64π sq. in. and the smaller circle has a radius of 6 in., what is the radius, in inches of the <u>larger circle</u>?

$$A = \pi R^2 - \pi r^2$$
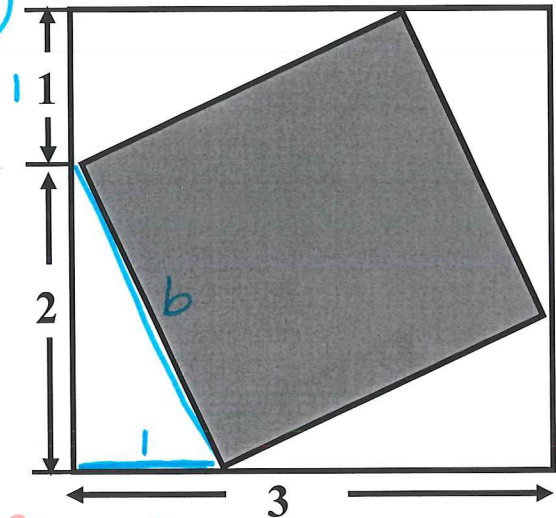$$64\pi = \pi R^2 - \pi 6^2$$
$$64\pi = \pi R^2 - 36\pi$$
$$+36\pi \qquad\qquad +36\pi$$
$$\frac{100\pi}{\pi} = \frac{\pi R^2}{\pi}$$
$$100 = R^2$$
$$\boxed{R = 10 \text{ in}}$$

⑧

$$1^2 + 2^2 = b^2$$
$$1 + 4 = b^2$$
$$\sqrt{5} = b$$
$$\sqrt{5} = h$$

The shaded square is inscribed in the larger square

$$A = b \cdot h$$
$$A = \sqrt{5} \cdot \sqrt{5}$$
$$A = \sqrt{25}$$
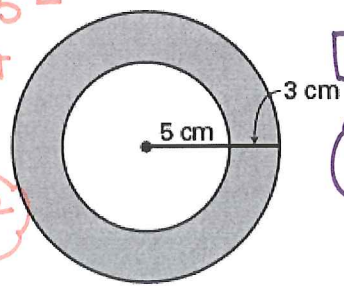$$\boxed{A = 5 \text{ units}^2}$$

⑨ $A = \pi R^2 - \pi r^2$
$A = \pi 8^2 - \pi 5^2$
$A = 64\pi - 25\pi$
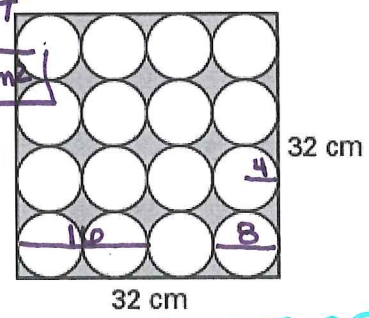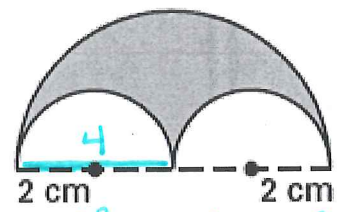$\boxed{A = 39\pi \text{ cm}^2}$
$\boxed{A \approx 122.5 \text{ cm}^2}$

⑩
$$A = 32 \cdot 32 - 16 \pi 4^2$$
$$\boxed{A = 1024 - 256\pi \text{ cm}^2}$$
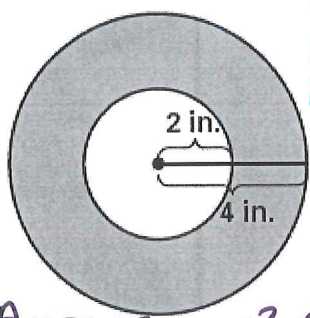$$\boxed{A \approx 219.8 \text{ cm}^2}$$

—3 cm
5 cm

32 cm
4
16   8
32 cm

⑪
2 cm   2 cm
4

$$A = \frac{1}{2}\pi 4^2 - 2 \frac{1}{2}\pi 2^2$$
$$A = 8\pi - 4\pi$$
$$\boxed{A = 4\pi \text{ cm}^2}$$
$$\boxed{A \approx 12.6 \text{ cm}}$$

⑫
2 in.
4 in.

$$A = \pi 4^2 - \pi 2^2$$
$$A = 16\pi - 4\pi$$
$$\boxed{A = 12\pi \text{ in}^2}$$
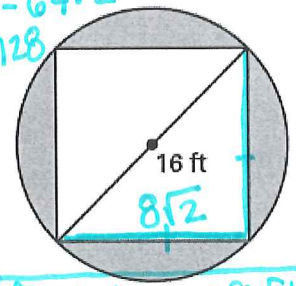$$\boxed{A \approx 37.7 \text{ in}}$$

⑬ $A = \pi 8^2 - 8\sqrt{2} \cdot 8\sqrt{2}$
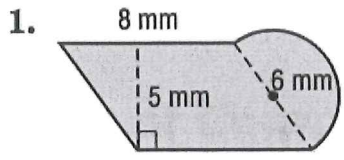$A = 64\pi - 64 \cdot 2$
$A = 64\pi - 128$

16 ft
$8\sqrt{2}$

$$\boxed{A = 64\pi - 128 \text{ ft}^2}$$
$$\boxed{A \approx 73.1 \text{ ft}^2}$$

Area of Composite Figures Quiz

*You may use a calculator and formula note card. Use extra worksheet to organize work, if necessary

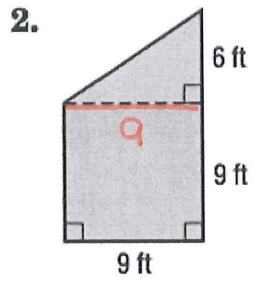**Find the area of each figure. Round to the nearest tenth if necessary.**

1.   8 mm

5 mm   6 mm

$A = b \cdot h + \frac{1}{2}\pi r^2$

$A = 8 \cdot 5 + \frac{1}{2}\pi 3^2$

$A = 40 + 4.5\pi \, mm^2$

$A_T \approx 54.1 \, mm^2$

2.

6 ft

9

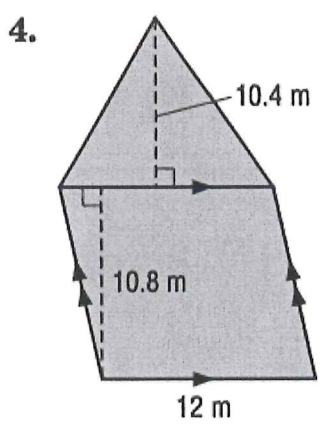9 ft

9 ft

$A = \frac{1}{2} \, 6 \cdot 9 + 9 \cdot 9$

$A_T = 108 \, ft^2$

3.   7 mi

5 mi

7 mi   5 mi

← 14 mi →

$A = 7 \cdot 7 + \frac{1}{2}5(5+7)$

$A_T = 79 \, mi^2$

4.

10.4 m

10.8 m

12 m
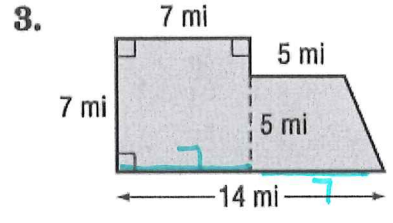
$A = \frac{1}{2} \, 12 \cdot 10.4 + 12 \cdot 10.8$

$A_T = 192 \, m^2$

5.

8 yd

8 yd

8 yd

$A = 8 \cdot 8 + \frac{1}{2}\pi 4^2$

$A = 64 + 8\pi \, yd^2$

$A \approx 89.1 \, yd^2$

6.   9 in.

3 in.

9

6.1 in.
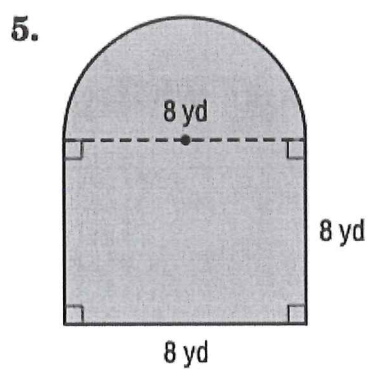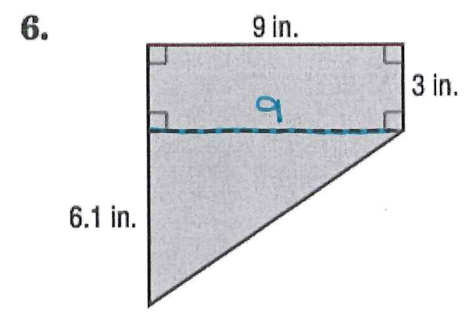
$A = 9 \cdot 3 + \frac{1}{2} \, 6.1 \cdot 9$
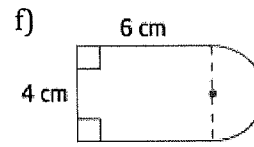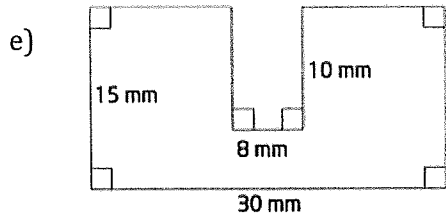
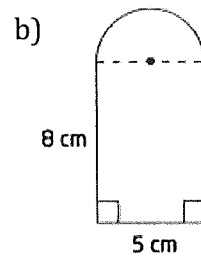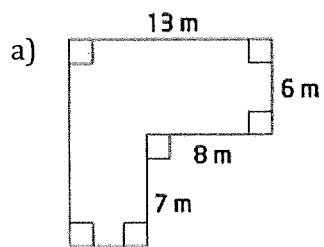$A = 54.45 \, in^2$

8.2 - Area of Composite Figures Worksheet
MPM1D
Jensen

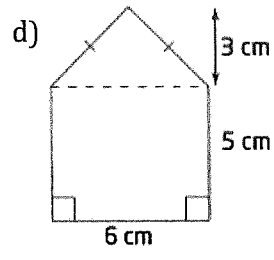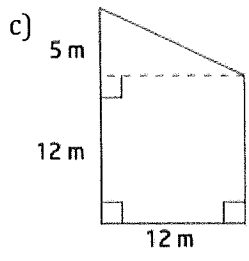**1.** Find the area of each of the composite figures:

a)

6 m

8 m

10 m

b)

13 m

12 m

c)

Note: the cut-out is a quarter circle

10 cm

20 cm

d)

2 m

6 m

4 m

e)

15 mm

10 mm

8 mm

30 mm

f)

6 cm

4 cm
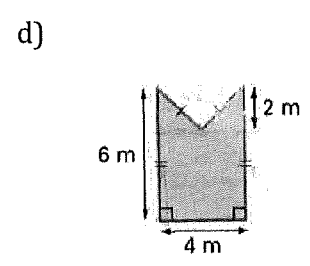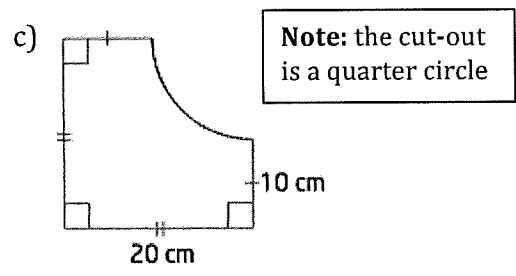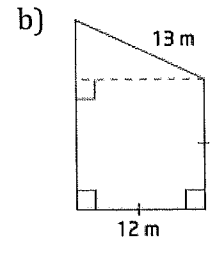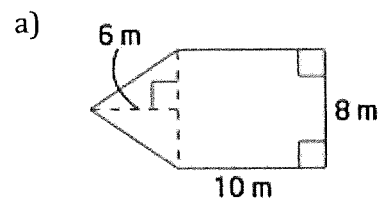
2. Find the perimeter of each of the composite figures:

a)

13 m

6 m

8 m

7 m

b)

8 cm

5 cm

c)
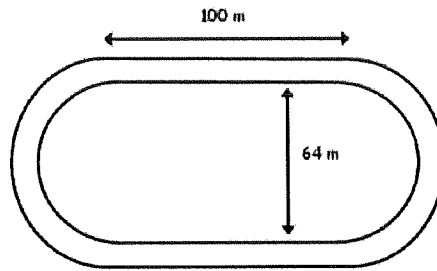
5 m

12 m

12 m

d)

3 cm

5 cm

6 cm

3. a) What length of fencing is needed to surround this yard?

11 m

18 m

16 m
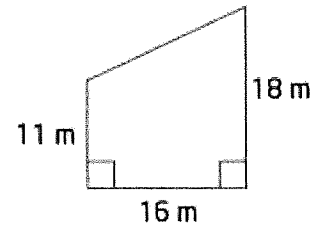
b) What is the area of the yard?

4. Here is a diagram of the track King's is thinking of adding around the new field. It consists of two parallel lines and a semicircle at each end. The track is 10 meters wide.

100 m

64 m

a) If someone runs one lap on the inside of the track, how far will they have run?

b) If someone runs one lap on the outside of the track, how far will they have run?

c) Find the difference between the distances of running on the inside or outside of the track.

Answers:

1) a) 104 m² b) 174 m² c) 321.5 cm² d) 20 m² e) 370 mm² f) 30.3 cm²

2) a) 52 m b) 28.9 cm c) 54 m d) 24.4 cm

3) a) 62.5 m b) 232 m²

4) a) 401.1 m b) 463.9 m c) 62.8 m