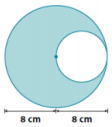
Name:
Date:
G7 M3 L20

Problem Set Sample Solutions

1. Find the area of the shaded region. Use 3.14 for π.

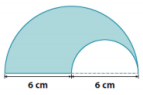


Area of large circle– area of small circle

$$(\pi \times (8\text{ cm})^2) - (\pi \times (4\text{ cm})^2)$$
$$(3.14)(64\text{ cm}^2) - (3.14)(16\text{ cm}^2)$$
$$200.96\text{ cm}^2 - 50.24\text{ cm}^2$$
$$150.72\text{ cm}^2$$

The area of the region is approximately 150.72 cm^2.

2. The figure shows two semicircles. Find the area of the shaded region. Use 3.14 for π.

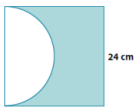


Area of large semicircle region – area of small semicircle region = area of the shaded region

$$\left(\frac{1}{2}\right)(\pi \times (6\text{ cm})^2) - \left(\frac{1}{2}\right)(\pi \times (3\text{ cm})^2)$$
$$\left(\frac{1}{2}\right)(3.14)(36\text{ cm}^2) - \left(\frac{1}{2}\right)(3.14)(9\text{ cm}^2)$$
$$56.52\text{ cm}^2 - 14.13\text{ cm}^2$$
$$42.39\text{ cm}^2$$

The area is approximately 42.39 cm^2.

3. The figure shows a semicircle and a square. Find the area of the shaded region. Use 3.14 for π.

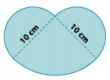


Area of the square – area of the semicircle

$$(24\text{ cm} \times 24\text{ cm}) - \left(\frac{1}{2}\right)(\pi \times (12\text{ cm})^2)$$
$$576\text{ cm}^2 - \left(\frac{1}{2}\right)(3.14 \times 144\text{ cm}^2)$$
$$576\text{ cm}^2 - 226.08\text{ cm}^2$$
$$349.92\text{ cm}^2$$

The area is approximately 349.92 cm^2.

4. The figure shows two semicircles and a quarter of a circle. Find the area of the shaded region. Use 3.14 for π.

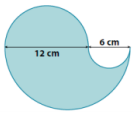


Area of two semicircles + area of quarter of the larger circle

$$2\left(\frac{1}{2}\right)(\pi \times (5\text{ cm})^2) + \left(\frac{1}{4}\right)(\pi \times (10\text{ cm})^2)$$
$$(3.14)(25\text{ cm}^2) + (3.14)(25\text{ cm}^2)$$
$$78.5\text{ cm}^2 + 78.5\text{ cm}^2$$
$$157\text{ cm}^2$$

The area is approximately 157 cm^2.

5. Jillian is making a paper flower motif for an art project. The flower she is making has four petals; each petal is formed by three semicircles as shown below. What is the area of the paper flower? Provide your answer in terms of π.

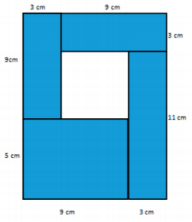


Area of medium semicircle + (area of larger semicircle – area of small semicircle)

$$\left(\frac{1}{2}\right)(\pi \times (6\text{ cm})^2) + \left(\left(\frac{1}{2}\right)(\pi \times (9\text{ cm})^2) - \left(\frac{1}{2}\right)(\pi \times (3\text{ cm})^2)\right)$$
$$18\pi\text{ cm}^2 + 40.5\pi\text{ cm}^2 - 4.5\pi\text{ cm}^2 = 54\pi\text{ cm}^2$$
$$54\pi\text{ cm}^2 \times 4$$
$$216\pi\text{ cm}^2$$

The area is $216\pi\text{ cm}^2$.

6. The figure is formed by five rectangles. Find the area of the unshaded rectangular region.

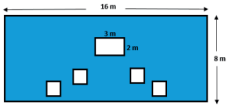


Area of the whole rectangle – area of the sum of the shaded rectangles = area of the unshaded rectangular region

$$(12\text{ cm} \times 14\text{ cm}) - (2(3\text{ cm} \times 9\text{ cm}) + (11\text{ cm} \times 3\text{ cm}) + (5\text{ cm} \times 9\text{ cm}))$$
$$168\text{ cm}^2 - (54\text{ cm}^2 + 33\text{ cm}^2 + 45\text{ cm}^2)$$
$$168\text{ cm}^2 - 132\text{ cm}^2$$
$$36\text{ cm}^2$$

The area is 36 cm^2.

7. The smaller squares in the shaded region each have side lengths of 1.5 m. Find the area of the shaded region.

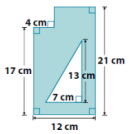


Area of the 16 m by 8 m rectangle – the sum of the area of the smaller unshaded rectangles = area of the shaded region

$$(16\text{ m} \times 8\text{ m}) - ((3\text{ m} \times 2\text{ m}) + (4(1.5\text{ m} \times 1.5\text{ m})))$$
$$128\text{ m}^2 - (6\text{ m}^2 + 4(2.25\text{ m}^2))$$
$$128\text{ m}^2 - 15\text{ m}^2$$
$$113\text{ m}^2$$

The area is 113 m^2.

8. Find the area of the shaded region.

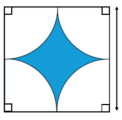


Area of the sum of the rectangles – area of the right triangle = area of shaded region

$$((17\text{ cm} \times 4\text{ cm}) + (21\text{ cm} \times 8\text{ cm})) - \left(\left(\frac{1}{2}\right)(13\text{ cm} \times 7\text{ cm})\right)$$
$$(68\text{ cm}^2 + 168\text{ cm}^2) - \left(\frac{1}{2}\right)(91\text{ cm}^2)$$
$$236\text{ cm}^2 - 45.5\text{ cm}^2$$
$$190.5\text{ cm}^2$$

The area is 190.5 cm^2.

9) The unshaded regions are quarter circles. Approximate the area of the shaded region.



Square
A = b * h
A = 14 * 14
A = 196 square feet.

Quarter circles
4 quarters equals 1 circle
A = pi * radius squared
A = 3.14 * 7^2
A = 153.86 square feet

Area
196.00 square feet
- 153.86 square feet
42.14 feet^2