MEASUREMENT CALCULATIONS IN TWO DIMENSIONS

PART A

1) Determine the perimeter of each shape.

a)
7 cm
4 cm

b)
6 m
3 m
5 m

c)
17.8 in
16.2 in
15.6 in
13.0 in

d)
10 mm
12 mm
13 mm
15 mm

e)
10.7 ft
9.8 ft
6.4 ft
19.4 ft
13.1 ft

f)
6.0 cm
8.5 cm
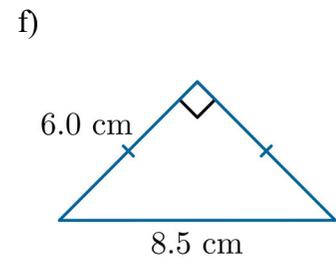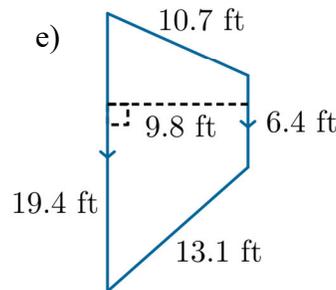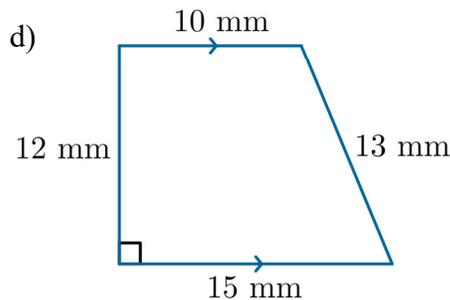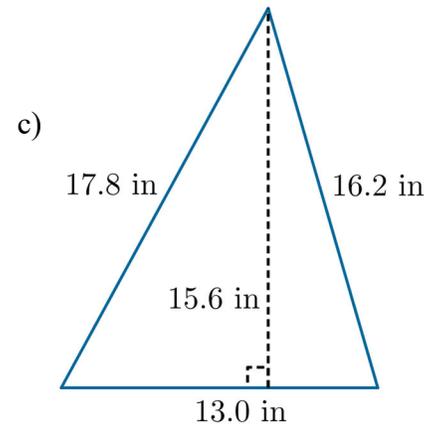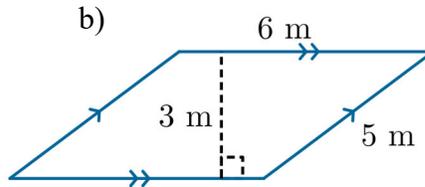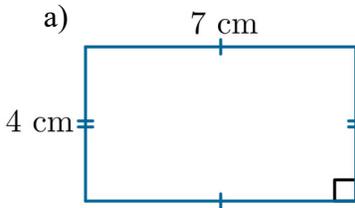
2) Determine the area of each shape in question #1.

3) Consider the circle shown on the right.
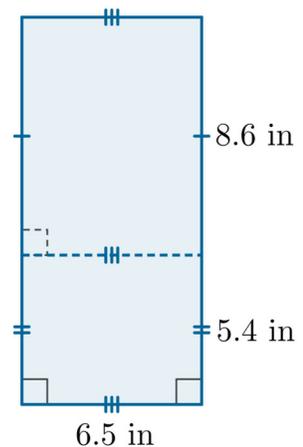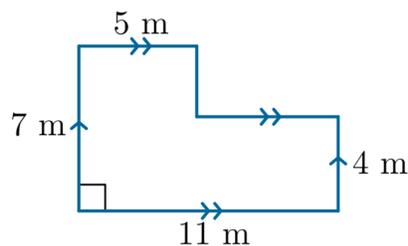   a) Determine the circle's radius.
   b) Calculate the circumference of the circle.
   c) Find the area of the circle.

8.4 cm
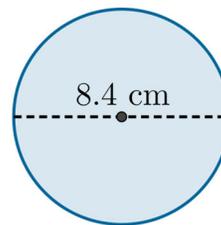
PART B

4) Determine the perimeter and area of the figure shown on the right.

5) Find the area and perimeter of the figure shown below.

5 m
7 m
4 m
11 m

8.6 in
5.4 in
6.5 in

6) A rectangle has a length of 12.5 m and an area of 390 m². Determine the width of the rectangle.

7) A square has a perimeter of 152 inches. Determine the area of the square.

8) A square has an area of 295.84 cm^2. Find the perimeter of the square.

9) A circle has an area of 3176.9 mm^2. Determine the circle's radius to the nearest tenth of a millimetre.

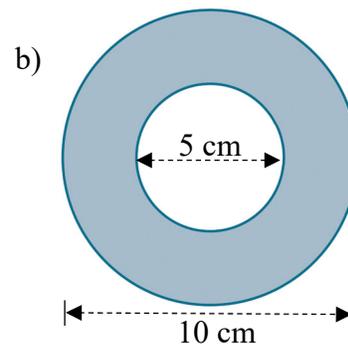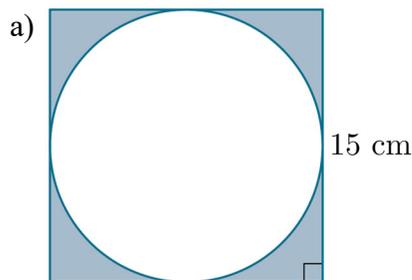10) Determine the area and perimeter of the semicircle shown on the right.

7 ft
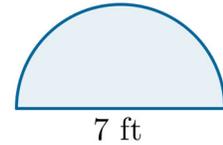
PART C

11) Determine the perimeter and area of the figure.

a)

9 m

12 m

b)

8.2 cm

11.4 cm
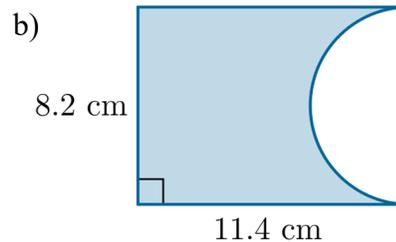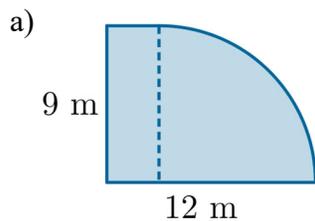
12) Determine the area of the shaded region.

a)

15 cm

b)

5 cm

10 cm

13) Ava has 120 m of fence to enclose an area for her pet ostrich.
   a) If Ava wants to give the ostrich the largest amount of space possible with a rectangular enclosure, what dimensions should she use? Find the largest area.
   b) Would the answer to part (a) change if the rectangular enclosure was built against the side of a barn and only required fencing on three sides? Explain.
   c) If instead of constructing a rectangular enclosure, Ava uses the 120 m of fence to build a circular enclosure, calculate the enclosed area and compare it to the areas from parts (a) and (b).
   d) Ava finally decided to construct a semicircular enclosure against the side of the barn (with the barn lying on the diameter of the semicircle). Calculate the enclosed area for this design and compare it to the areas from parts (a), (b) and (c).

ANSWERS

1) a) 22 cm   b) 22 m   c) 47.0 in   d) 50 mm   e) 49.6 ft   f) 20.5 cm

2) a) 28 cm^2 b) 18 m^2 c) 101.4 in^2 d) 150 mm^2 e) 126.4 ft^2 f) 18 cm^2

3) a) 4.2 cm   b) 26.4 cm   c) 55.4 cm^2

4) perimeter = 41 in, area = 91 in^2

5) area = 59 m^2, perimeter = 36 m

6) 31.2 m

7) 1444 in^2

8) 68.8 cm

9) 31.8 mm

10) area $\approx$ 19.2 ft^2, perimeter $\approx$ 18.0 ft

11) a) perimeter $\approx$ 38.1 m, area $\approx$ 90.6 m^2 b) perimeter $\approx$ 43.9 cm, area $\approx$ 67.1 cm^2

12) a) 48.3 cm^2 b) 58.9 cm^2

13) a) 30 m $\times$ 30 m (a square), which gives an area of 900 m^2.   b) Yes. In this case, a square does not give the greatest area. The greatest area occurs when the length of the rectangle is along the barn and is twice the width. Specifically, the greatest area is achieved when the length is 60 m (along the barn) and the width is 30 m. The resulting area is 1800 m^2 c) 1145.9 m^2. This area is greater than the maximum area possible when fencing all four sides of a rectangular enclosure, but less than the maximum area possible when using the barn as one side of a rectangular enclosure.   d) 4583.7 m^2. This design gives a greater area than each of the other three designs.