Definitions of Circle and Parts of Circle

_____ A circle is a set of points that are equidistant from a center point.

_____ The point in the middle, equidistant from all points on the circle.

_____ The distance from the center to the circle.

_____ The distance through the center across the entire circle.

_____ The distance around the circle.

_____ The region contained within the circle.
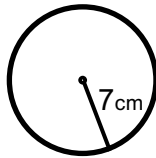

FORMULA:

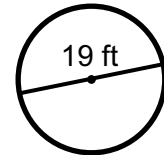**Rule #1:** The diameter is twice the radius.

$$D = 2r$$

Instructions: Find the missing piece.

1. Find the diameter.

7cm

Diamter = _____

2. Find the radius.

19 ft

Radius = _____

FORMULA:

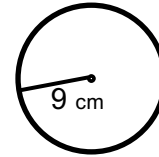**Rule #2:** The circumference of a circle is equal to diameter times pi.

Rule #3: The area of a circle is equal to pi times the radius squared.

Remember that

3. Find the Circumference and Area of the following circle:

9 cm

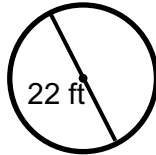Circumference: Area:

Instructions: Find the missing pieces of each circle. (Round answers to the nearest hundredth, if necessary.)

4.

22 ft

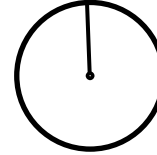Radius: Diameter:

Circumference: Area:

5.

Radius: **15 cm**   Diameter:

Circumference: Area:

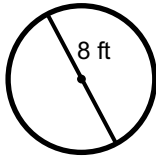6.   A cell phone tower has a range of 4 miles. Find the area covered by the tower.

15.1 Circles
Math 7

Instructions: Find the missing pieces of each circle. Round answers to the nearest hundredth, if necessary.

1.

8 ft

Radius: Diameter:

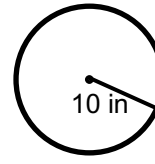Circumference: Area:

2.

10 in

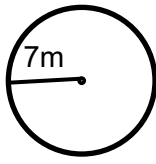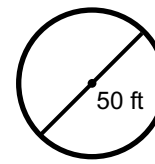Radius: Diameter:

Circumference: Area:

3.

7m

Radius: Diameter:

Circumference: Area:

4.

50 ft

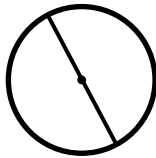Radius: Diameter:

Circumference: Area:

5.

THE DIAMTER IS 100 CM.

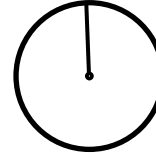Radius: Diameter: 100 CM

Circumference: Area:

6.

THE RADIUS IS 75 M.

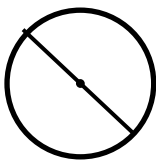Radius: 75 M   Diameter:
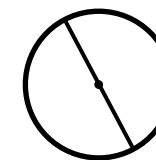
Circumference: Area:

7.

THE DIAMETER IS 2 YARDS.

Radius: Diameter:

Circumference: Area:

8.

THE DIAMETER IS 1 MILE.

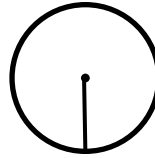Radius: Diameter:

Circumference: Area:

9. Find the missing pieces of a circle with a radius of 16 cm. Round answers to the nearest hundredth, if necessary.

Radius: Diameter:

Circumference: Area:

10.   Mr. Sullivan is riding a bicycle with a tire radius of 12 cm. when he accidentally runs over a small puddle of paint on the road. When he continues riding, his bicycle leaves marks on the road that represent the circumference of the bicycle tire. How far apart are the marks on the road?

A *semicircle* is a half circle, formed by cutting the circle along a diameter. Find the area of the following semicircles by using the area of a circle formula and diving your answer by 2.
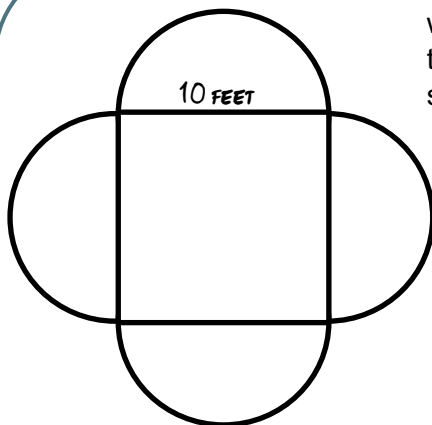
11.

40 CM

12.

THE RADIUS IS 6 YARDS.
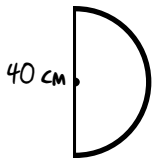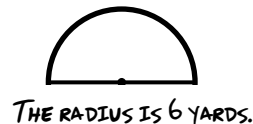
EXIT TICKET

For an art project, Mr. Bean joined four semicircles to each side of a square with a side length of 10 feet. He needs to paint the figure, but isn't sure of the total area. Find the total area of the figure by finding the area of each semicircle and adding it to the area of the square.

10 FEET

Write your questions and thoughts here!

Paralleogram: a quadrilateral with two pair of parallel sides.

Area of Paralleogram

FORMULA:

$$A = bh$$

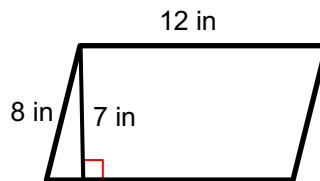**Rule #1:** The area of a parallelogram is the base times the height.
(Look for the red right-angle mark to determine the base and height!)

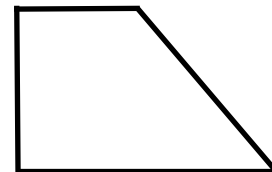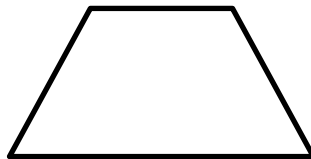**Instructions: Find area of the following parallelograms.**

1. Find the area.

   12 in

   8 in   7 in

   Area =

2. Find the area of a parallelogram with a height of 4 cm and a base of 12 cm.

   Area =

Trapezoid: a quadrilateral with eactly ONE pair of parallel sides.

Area of Trapezoid

FORMULA:

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

Rule #2:   The area of a trapezoid equals the height times the average of the bases.

(Look for the red right-angle mark to determine the bases and height!)

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

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3. Find the area of the following trapezoid:

18 in

10 in

12 in

8 in
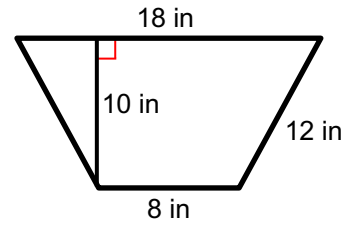
Area:_____

Instructions: Find the area of the following trapezoids.

4.

20 m

16 m

12 m

30 m

Area:_____

5.

10 cm

4 cm

8 cm

6 cm
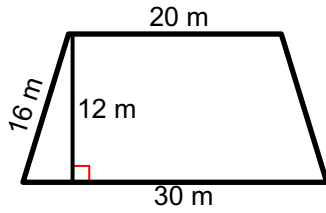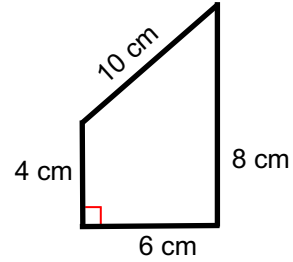
Area:_____

6.   Find the area of the following compound figure.
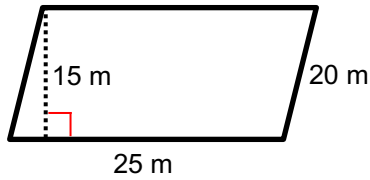
6 ft

4 ft

8 ft

10 ft

9 ft
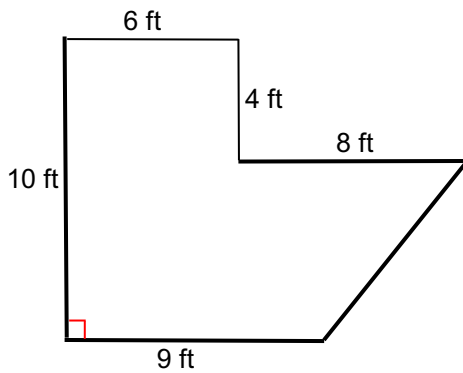
Area:_____

15.2 Area of Parallelograms and Trapezoids

Math 7

Instructions: Find the area of each figure.

1.

15 m · 20 m · 25 m

Area:_____

2.

7 in · 6 in · 5 in · 10 in

Area:_____

3.

6 cm · 10 cm · 11 cm · 5 cm

Area:_____

4.

11 ft · 8 ft · 10 ft

Area:_____

5.

5 mm · 4 mm · 1 mm

Area:_____

6.

12 cm

Area:_____

7.

18 m · 6 m · 4 m · 10 m

Area:_____

8.

36 ft · 38 ft · 37 ft · 40 ft

Area:_____

Find the area of each figure.
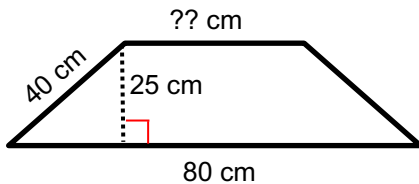
9.

6 m

8 m

15 m

Area:_____

10.

19 ft

6 ft

4 ft

18 ft
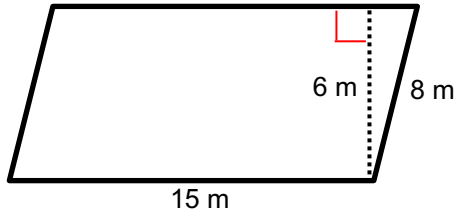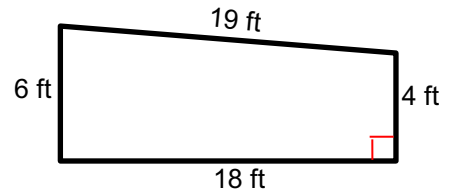
Area:_____

11.   Find the missing base if the trapezoid's area is 1600 cm².
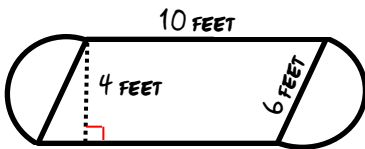
?? cm

40 cm

25 cm

80 cm

EXIT TICKET

10 FEET

4 FEET

6 FEET

For an art project, Mr. Brust joined two semicircles to each side of a parallelogram with a base of 10 ft. and a height of 4ft. The diameter of the semicircles was 6 ft. He needs to paint the figure, but isn't sure of the total area. Find the total area of the figure by finding the area of each semicircle and adding it to the area of the parallelogram.

Rectangular Prism: a 3-dimensional figure with two identical rectangles that face each other connected by rectangles
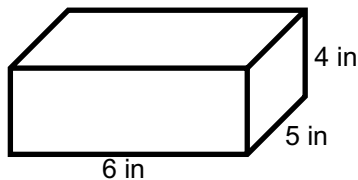
Examples:
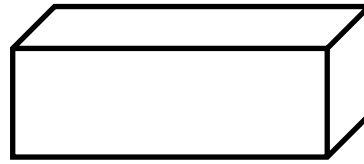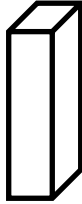
Surface Area of a Rectangular Prism

The area of a rectangular prism is the sum of the areas of each face of the prism.
(There are 6 faces!)

FORMULA: $SA = 2lw + 2hl + 2hw$
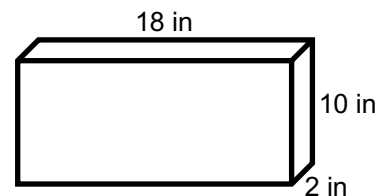
Instructions: Find surface area of the following prisms.

1. **Example**. Find the surface area of the following rectangular prism:
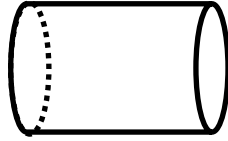
Method #2: Use the formula

4 in
5 in
6 in

Method #1: Add the areas of the 6 faces.

2. **You try!** Find the surface area of the rectangular prism:

18 in
10 in
2 in

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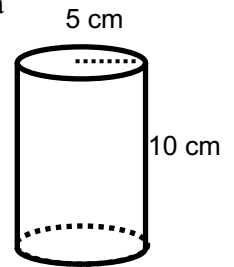**Cyclinder:** a 3-dimensional figure with two identical circles that are connected by a curved edge

Surface Area of a Cylinder

The surface area of a cylinder is the sum of the areas of each face (circle) and the rectangle that connects them.
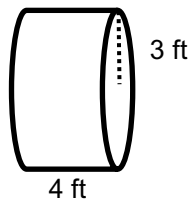
$$\textit{FORMULA:} \quad SA = 2(\pi r^2) + (\pi D)h$$
$$SA = 2\pi r^2 + 2\pi rh$$

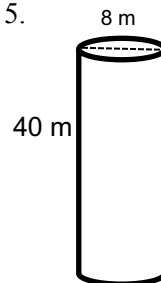3. **Example**. Find the area of the following cylinder, with a radius of 5 cm and a height of 10 cm.

5 cm

10 cm

Instructions: Find the area of the following cylinders.

4.

3 ft

4 ft

Surface Area: _____

5.

8 m

40 m
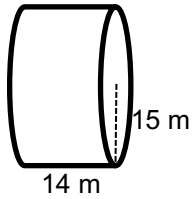
Surface Area: _____

15.3 Surface area of Rectangular Prisms and Cylinders

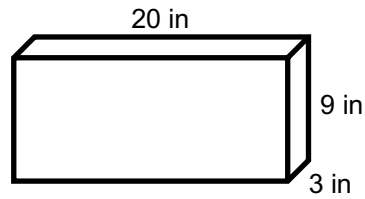**Instructions: Find the area of each figure. Round to the nearest hundredth, if necessary.**
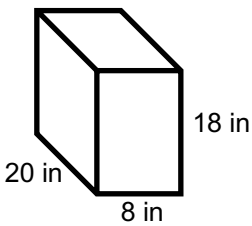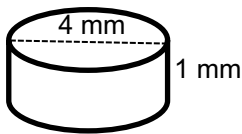
1.

15 m

14 m

Surface Area: _____

2.

20 in

9 in

3 in

Surface Area: _____

3.

18 in

20 in

8 in

Surface Area: _____

4.

3 ft

11 ft

Surface Area: _____

5.

4 mm

1 mm

Surface Area: _____

6.

3 in

4 in

20 in

Surface Area: _____

7.

10 ft

Radius = 6 ft

Surface Area: _____

8.

10 ft

10 ft

10 ft

Surface Area: _____

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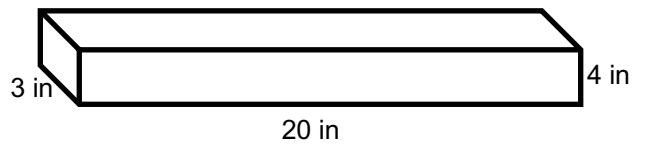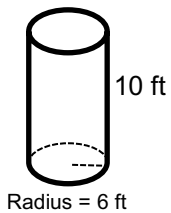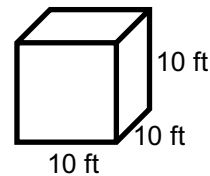
Find the surface area of each figure.

9.

16 m

15 m

Surface Area: _____

10.

24 in

4 in

1 in
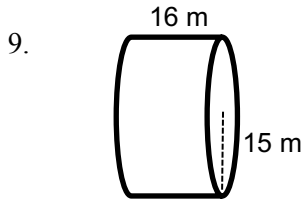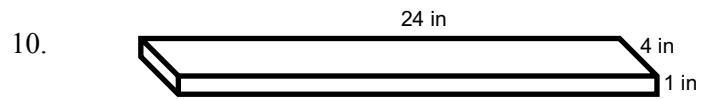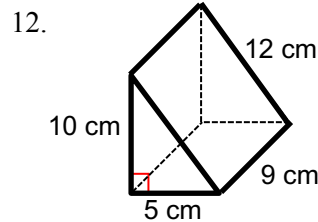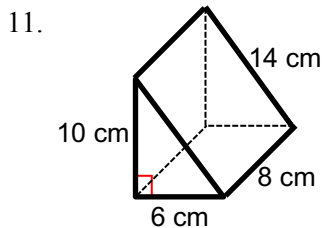
Surface Area: _____

The surface area of a triangular prism works the same way! Find the surface area by adding the total area of each triangular faces (2) to the total area of each rectangular face (3).

11.

14 cm

10 cm

8 cm

6 cm

12.

12 cm

10 cm

9 cm

5 cm

EXIT TICKET

Sully has built a mailbox. It's basically a wooden box on a poll. The poll has a diameter of 8 cm. He needs to put a weather resistant paint on the outside. Find the total surface area of the mailbox and post so that he knows how much paint to purchase. (Hint: He does not need to paint the top or bottom of the poll.)

40 cm

10 cm

12 cm

100 cm

8 cm

15.4 Volume of Rectangular Prisms and Cylinders

15.4 Notes
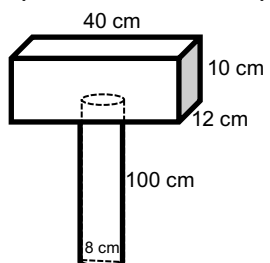
Volume: the amount of space an object occupies
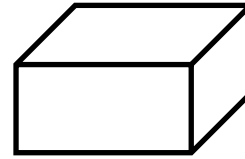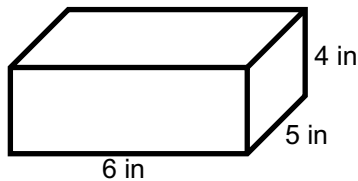
Volume of a Rectangular Prism or Cylinder

The volume of a rectangular prism or cylinder is the area of the base times the height.

$$\textit{FORMULA: } V = Bh$$

where B is the area of one of the bases.
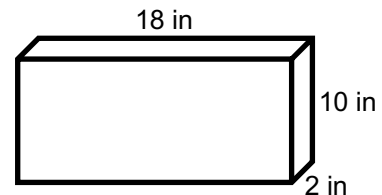
Instructions: Find surface area of the following prisms.

1. **Example**. Find the volume of the following rectangular prism:

4 in
5 in
6 in

STEP 1: FIRST FIND THE AREA OF THE BASE

STEP 2: MULTIPLY BY THE HEIGHT

2. **You TRY!** Find the volume of the rectangular prism:

18 in
10 in
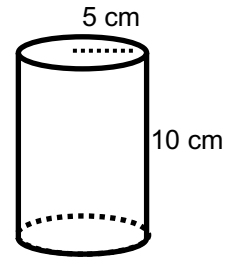2 in

Cylinder: use the same formula as prism

FORMULA: $V = Bh$

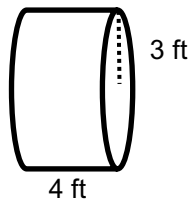3. **Example**. Find the volume of the following cylinder, with a radius of 5 cm and a height of 10 cm.

5 cm

10 cm

STEP 1: FIRST FIND THE AREA OF THE BASE

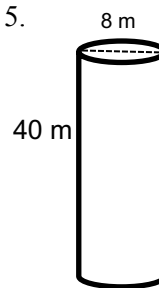**STEP 2: MULTIPLY BY THE HEIGHT**

Instructions: Find the volume of the following cylinders. Round to the nearest hundredth, if necessary. Assume angles that appear to be right angles are right angles.
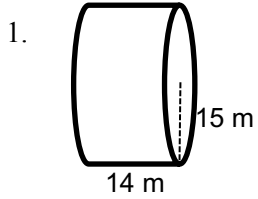
4.

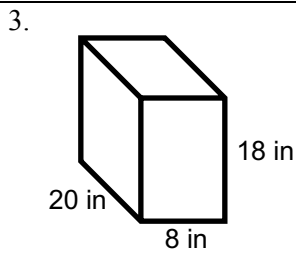3 ft

4 ft

Volume: _____

5.

8 m

40 m

Volume: _____

Instructions: Find the volume of each figure. Round to the nearest hundredth, if necessary. Assume angles that appear to be right angles are right angles.
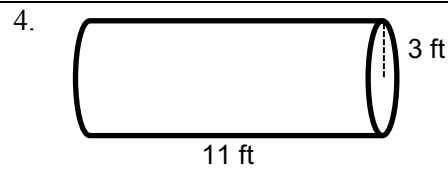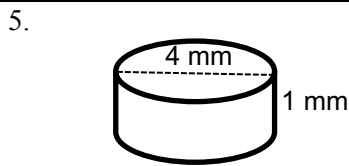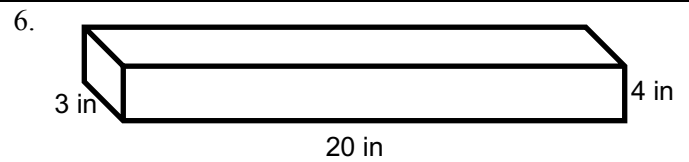
1.

15 m

14 m

Volume: _____

2.

20 in

9 in

3 in

Volume: _____

3.

18 in

20 in

8 in

Volume: _____

4.

3 ft

11 ft

Volume: _____

5.

4 mm

1 mm

Volume: _____

6.

3 in

4 in

20 in

Volume: _____

7.

10 ft

Radius = 6 ft

Volume: _____

8.

10 ft

10 ft

10 ft

Volume: _____

Find the volume of each figure.

9.

16 m

15 m

Volume: _____

10.

24 in

4 in

1 in
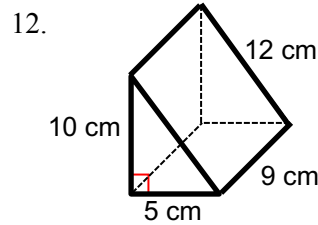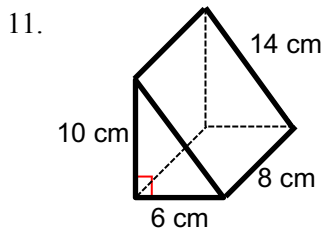
Volume: _____

The volume of a triangular prism works the same way! Find the volume by calculating the total area of each triangular base (2) and then multiplying by the height.

11.

14 cm

10 cm

8 cm

6 cm

12.

12 cm

10 cm

9 cm

5 cm

EXIT TICKET

Brust loves JellyBeans! At his favorite JellyBean store, he can bring his own container and fill it himself with the JellyBeans. He has two boxes that he can use. He obviously wants the most JellyBeans he can get. Should he use Box #1 or Box #2?

Box #1

10 cm

8 cm

12 cm

Box #2

4 cm

16 cm

15 cm
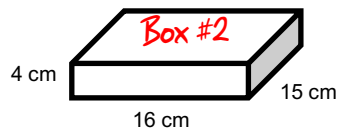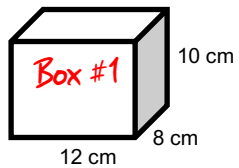
Here are your important formulas:

$C = \pi D \quad A = \pi r^2$

$\pi \approx 3.14$
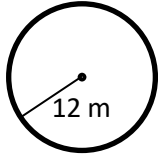
$A = bh$

$A = \frac{1}{2}(b_1 + b_2)h$
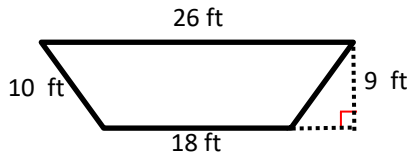
$SA = 2lw + 2hl + 2hw$

$V = Bh$

$SA = 2\pi r^2 + 2\pi rh$

$V = Bh$
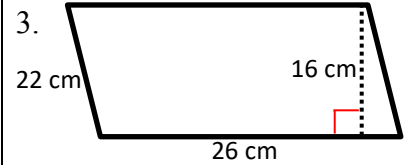
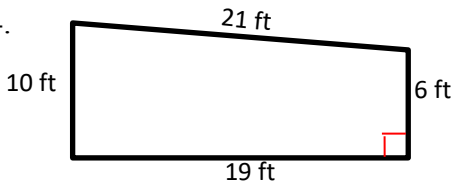**Find the area of the following figures** (5 pts each)

1.

12 m

2.

26 ft

10 ft

9 ft

18 ft

3.

22 cm

16 cm

26 cm
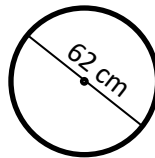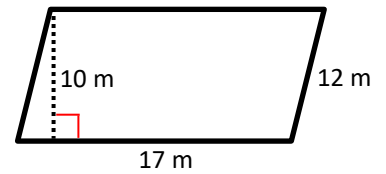
4.

21 ft

10 ft

6 ft

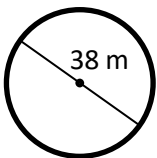19 ft

5.

62 cm

6.

10 m

12 m

17 m

Instructions: Find the missing pieces of the circle. Round to the nearest hundredth, if necessary. (5 pts each)
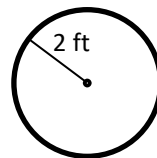
7.

38 m

Diameter:_____ (+1)

Circumference:_____ (+2)

Area:_____ (+2)

8.

2 ft

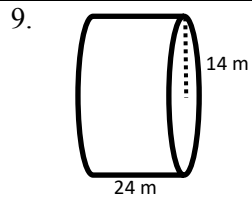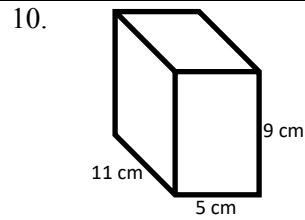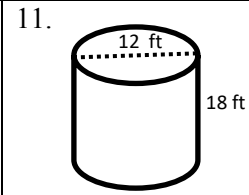Diameter:_____ (+1)

Circumference:_____ (+2)

Area:_____ (+2)

Instructions: Find the surface area of the following prisms and cylinder. Remember, any formulas needed are on the first page. (5 pts each)

9.

14 m

24 m

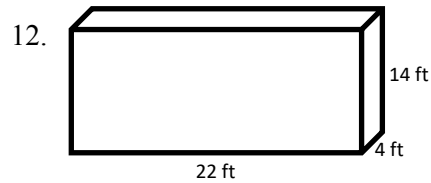Surface Area:_____

10.

9 cm

11 cm

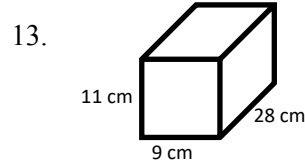5 cm

Surface Area:_____

11.

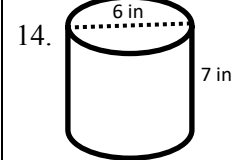12 ft

18 ft

Surface Area:_____

Instructions: Find the volume of the following cylinders. Round to the nearest hundredth, if necessary. Assume angles that appear to be right angles are right angles. Remember, any formulas needed are on the first page. (5 pts each)

12.

14 ft

4 ft

22 ft

Volume:_____

13.

11 cm

28 cm

9 cm

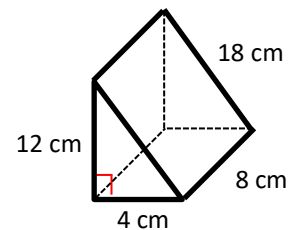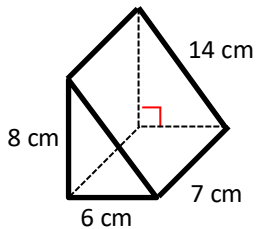Volume:_____

14.

6 in

7 in

Volume:_____

15. For an art project, Mr. Brust joined two semicircles to each side of a parallelogram with a base of 18 ft. and a height of 5 ft. The diameter of the semicircles was 7 ft. He needs to paint the figure, but isn't sure of the total area. Find the total area of the figure by finding the area of each semicircle and adding it to the area of the parallelogram.

18 FEET

5 FEET

7 FEET
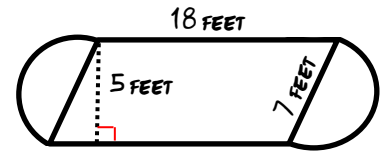
16. Find the missing base if the trapezoid's area is 1000 cm².

?? CM

35 CM

20 CM

65 CM
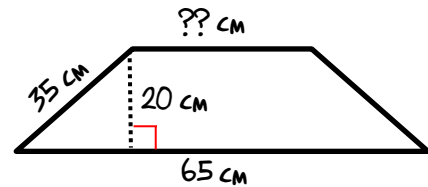
Find the surface area and volume of each figure. Show your work!

14 cm

8 cm

7 cm

6 cm

18 cm

12 cm

8 cm

4 cm

17. Surface Area:_____

18. Surface Area:_____

19. Volume:_____

20. Volume:_____