ACCELERATED MATHEMATICS

CHAPTER 15

DIMENSIONAL GEOMETRY II

TOPICS COVERED:

• Volume of Cylinders
• Volume of Cones
• Volume of Spheres
• Surface Area of Prisms
• Surface Area of Cylinders
# Accelerated Mathematics Formula Chart

**Name:**

## Linear Equations

<table>
<thead>
<tr>
<th>Type</th>
<th>Formula</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope-intercept form</td>
<td>( y = mx + b )</td>
<td></td>
</tr>
<tr>
<td>Direct Variation</td>
<td>( y = kx )</td>
<td>8\textsuperscript{th}</td>
</tr>
<tr>
<td>Constant of proportionality</td>
<td>( k = \frac{y}{x} )</td>
<td></td>
</tr>
<tr>
<td>Slope of a line</td>
<td>( m = \frac{y_2 - y_1}{x_2 - x_1} )</td>
<td>8\textsuperscript{th}</td>
</tr>
</tbody>
</table>

## Circumference

<table>
<thead>
<tr>
<th>Shape</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circle</td>
<td>( C = 2\pi r ) or ( C = \pi d )</td>
</tr>
</tbody>
</table>

## Area

<table>
<thead>
<tr>
<th>Shape</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangle</td>
<td>( A = bh )</td>
</tr>
<tr>
<td>Parallelogram</td>
<td>( A = bh )</td>
</tr>
<tr>
<td>Triangle</td>
<td>( A = \frac{bh}{2} ) or ( A = \frac{1}{2}bh )</td>
</tr>
<tr>
<td>Trapezoid</td>
<td>( A = \frac{1}{2}(b_1 + b_2)h )</td>
</tr>
<tr>
<td>Circle</td>
<td>( A = \pi r^2 )</td>
</tr>
</tbody>
</table>

## Surface Area

<table>
<thead>
<tr>
<th>Shape</th>
<th>Lateral</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prism</td>
<td>( S = Ph )</td>
<td>( S = Ph + 2B )</td>
</tr>
<tr>
<td>Cylinder</td>
<td>( S = 2\pi rh )</td>
<td>( S = 2\pi rh + 2\pi r^2 )</td>
</tr>
</tbody>
</table>

## Volume

<table>
<thead>
<tr>
<th>Shape</th>
<th>Formula</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangular prism</td>
<td>( V = Bh )</td>
<td></td>
</tr>
<tr>
<td>Rectangular prism</td>
<td>( V = Bh )</td>
<td></td>
</tr>
<tr>
<td>Pyramid</td>
<td>( V = \frac{1}{3}Bh )</td>
<td></td>
</tr>
<tr>
<td>Cylinder</td>
<td>( V = Bh ) or ( V = \pi r^2h )</td>
<td>8\textsuperscript{th}</td>
</tr>
<tr>
<td>Cone</td>
<td>( V = \frac{1}{3}Bh )  or ( V = \frac{1}{3}\pi r^2h )</td>
<td>8\textsuperscript{th}</td>
</tr>
<tr>
<td>Sphere</td>
<td>( V = \frac{4}{3}\pi r^3 )</td>
<td>8\textsuperscript{th}</td>
</tr>
</tbody>
</table>

## Pi

\( \pi = 3.14 \) or \( \pi = \frac{22}{7} \)

## Distance

\( d = rt \)

## Simple Interest

\( I = prt \)

## Compound Interest

\( A = P(1 + r)^t \)

## Pythagorean Theorem

\( a^2 + b^2 = c^2 \) 8\textsuperscript{th} grade

## Customary – Length

- 1 mile = 1760 yards
- 1 yard = 3 feet
- 1 foot = 12 inches

## Customary – Volume/Capacity

- 1 pint = 2 cups
- 1 cup = 8 fluid ounces
- 1 quart = 2 pints
- 1 gallon = 4 quarts

## Customary – Mass/Weight

- 1 ton = 2,000 pounds
- 1 pound = 16 ounces

## Metric – Length

- 1 kilometer = 1000 meters
- 1 meter = 100 centimeters
- 1 centimeter = 10 millimeters

## Metric – Volume/Capacity

- 1 liter = 1000 milliliters

## Metric – Mass/Weight

- 1 kilogram = 1000 grams
- 1 gram = 1000 milligrams

Created by Lance Mangham, 6\textsuperscript{th} grade math, Carroll ISD
<table>
<thead>
<tr>
<th>EXAMPLES</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$A = \frac{1}{2}(b_1 + b_2)h$</td>
<td>$V = \pi r^2 h$</td>
<td>$S = 2B + Ph$</td>
</tr>
<tr>
<td>$A = \frac{1}{2}(10 + 20) \cdot 6$</td>
<td>$V = 3.14 \cdot 10^2 \cdot 5$</td>
<td>$S = 2(8 \cdot 6) + (28) \cdot 10$</td>
</tr>
<tr>
<td>$A = 90 \text{ cm}^2$</td>
<td>$V = 1570 \text{ m}^3$</td>
<td>$S = 376 \text{ in}^2$</td>
</tr>
<tr>
<td>Cube</td>
<td>Square prism</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td><img src="image1.png" alt="Cube" /></td>
<td><img src="image2.png" alt="Square prism" /></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rectangular prism</th>
<th>Right triangular prism</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.png" alt="Rectangular prism" /></td>
<td><img src="image4.png" alt="Right triangular prism" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trapezoidal prism</th>
<th>Isosceles triangular prism</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image5.png" alt="Trapezoidal prism" /></td>
<td><img src="image6.png" alt="Isosceles triangular prism" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cylinder</th>
<th>Cone</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image7.png" alt="Cylinder" /></td>
<td><img src="image8.png" alt="Cone" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Triangular and Square Pyramids</th>
<th>Sphere</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image9.png" alt="Triangular and Square Pyramids" /></td>
<td><img src="image10.png" alt="Sphere" /></td>
</tr>
</tbody>
</table>
Activity 15-1: **Volume of Cylinders**

The volume of a solid is how much it can hold or the measure of the amount of space it occupies.

It is measured in cubic units.

The formula for a cylinder is $V = Bh$ or $V = \pi r^2 h$.

The $B$ stands for the area of the base and the $h$ stands for the height of the cylinder.

Find volume of the cylinder.

$V = \phantom{12\text{ cm}}$  
$V = \phantom{15\text{ m}}$

Please measure to the nearest $\frac{1}{4}$ of an inch.

Dimensions: $\phantom{12\text{ cm}}, \phantom{15\text{ m}}, \phantom{43\text{ m}}$

$V = \phantom{12\text{ cm}}$
Activity 15-2: **Volume of Cylinders**

Name: 

1-4. Find the volume of each cylinder.

1. 

| Diameter = 10 ft | Height = 21 ft |

2. 

| 7 mm | 5 mm |

3. 

| 6 m | 8 m |

4. 

| 10 ft |

Find the volume of the cylinder with radius $r$ and height $h$.

5. $r = 6$ in, $h = 12$ in  
6. $r = 2$ cm, $h = 13$ cm  
7. $r = 1.9$ m, $h = 8.7$ m

8-10. Find the volume of the solid. If two units of measure are used, give your answer in the smaller units. Round your answer to the nearest hundredth.

8. 

| $r = 6.4$ in |

9. 

| 8 ft | 21 ft |

10. 

| $B = 5.4$ cm$^2$ | 32 mm |
Find the volume of each cylinder. Round your answer to the nearest tenth if necessary. Use 3.14 for $\pi$.

1. [Diagram of a cylinder with dimensions 6.5 cm by 16 cm]

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. A cylindrical oil drum has a diameter of 2 feet and a height of 3 feet. What is the volume of the oil drum?</td>
<td></td>
</tr>
<tr>
<td>4. New Oats cereal is packaged in a cardboard cylinder. The packaging is 10 inches tall with a diameter of 3 inches. What is the volume of the New Oats cereal package?</td>
<td></td>
</tr>
<tr>
<td>5. A small plastic storage container is in the shape of a cylinder. It has a diameter of 7.6 centimeters and a height of 3 centimeters. What is the volume of the storage cylinder?</td>
<td></td>
</tr>
<tr>
<td>6. A can of juice has a diameter of 6.6 centimeters and a height of 12.1 centimeters. What is the total volume of a six-pack of juice cans?</td>
<td></td>
</tr>
<tr>
<td>7. Mr. Macady has an old cylindrical grain silo on his farm that stands 25 feet high with a diameter of 10 feet. Mr. Macady is planning to tear down the old silo and replace it with a new and bigger one. The new cylindrical silo will stand 30 feet high and have a diameter of 15 feet. What is the volume of the old silo?</td>
<td></td>
</tr>
<tr>
<td>8. In the problem above, what is the volume of the new silo?</td>
<td></td>
</tr>
<tr>
<td>9. In the problems above, how much greater is the volume of the new silo than the old silo?</td>
<td></td>
</tr>
<tr>
<td>10. Matt is filling an inflatable pool with water from a hose. The pool is in the shape of a cylinder and has a diameter of 7 feet. How long will it take to fill the pool to a depth of 8 inches if the hose fills a 1 gallon milk jug in 3 seconds? (Hint: There are 231 in$^3$ in a gallon.)</td>
<td></td>
</tr>
</tbody>
</table>
For the four problems below use the four corresponding pictures.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A cylindrical glass vase is 6 inches in diameter and 12 inches high. There are 3 inches of sand in the vase, as shown. Which of the following is closest to the volume of the sand in the vase?</td>
<td>A 85 in(^3) B 254 in(^3) C 54 in(^3) D 339 in(^3)</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>The radius of the base of a can of lemonade mix is 6 cm. The height of the can is 15 cm. The lemonade mix fills the can to a height of 7 cm. What is the volume of the lemonade mix in the can?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>The radius of the base of a paint can is 4 cm. The height of the can is 16 cm. The paint in the can fills it to a height of 10 cm. How many liters of paint thinner must be added to the can in order to completely fill it to the top? Note: 1 liter of paint thinner fills 1000 cm(^3).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>The radius of the base of a right circular cylinder is 8 cm. The height of the cylinder is 20 cm. Find the volume of the cylinder.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PIECE OF CAKE
VOLUME TASK

You are in charge of ordering a cake for your friend’s party. Cassie’s Cake Company offers 3 designs of cakes, all for the same price. Calculate which cake design gives you the greatest volume to find out which type you should buy. Show your work. Round your answers to the nearest tenth.
Activity 15-5: **Volume of Cones**

The volume of a cone is one third the product of the area of the base, $B$ and the height, $h$.

$$V = \frac{1}{3} Bh = \frac{1}{3} \pi r^2 h$$

1. A jewelry maker designs a pair of cone shaped earrings out of sterling silver. How much sterling silver is needed to make a pair of earrings?

Find the volume of the cone with radius $r$ and height $h$.

2. $r = 8 \text{ in}, \ h = 15 \text{ in}$

3. $r = 10 \text{ m}, \ h = 9 \text{ m}$

4. $r = 24 \text{ mm}, \ h = 18 \text{ mm}$

5-7. Find the volume of the cone. If two units of measure are used, give your answer in the smaller units. Round to the nearest tenth.

Find the volume of the cone with the given dimensions, where $r =$ radius, $d =$ diameter, and $h =$ height. If two units are used, give your answer in the smaller units. Round to the nearest tenth.

8. $r = 4 \text{ in}, \ h = 12 \text{ in}$

9. $r = 2.1 \text{ m}, \ h = 84 \text{ cm}$

10. $d = 11 \text{ ft}, \ h = 24 \text{ ft}$

Created by Lance Mangham, 6th grade math, Carroll ISD
Find the volume of each cone. Round your answer to the nearest tenth if necessary. Use 3.14 for π.

1. [Image of cone with dimensions]

2. [Image of cone with dimensions]

3. The mold for a cone has a diameter of 4 inches and is 6 inches tall. What is the volume of the cone mold to the nearest tenth?

4. A medium-sized paper cone has a diameter of 8 centimeters and a height of 10 centimeters. What is the volume of the cone?

5. A funnel has a diameter of 9 in. and is 16 in. tall. A plug is put at the open end of the funnel. What is the volume of the cone to the nearest tenth?

6. A party hat has a diameter of 10 cm and is 15 cm tall. What is the volume of the hat?

7. Find the volume of the composite figure to the nearest tenth.
   - a. Volume of cone
   - b. Volume of cylinder
   - c. Volume of composite figure

8. **Cone Formula:** \( V = \frac{1}{3} \pi r^2 h \)
   - What is the height of the cone? ________
   - What is the radius of the base? ________

9. A typical lodge pole pine tree found in Montana has a trunk that is about 8 inches in diameter at its base and grows to 50 feet tall. Estimate the volume of the trunk of the tree in cubic feet.

10. How many lodge pole pines are needed to make 1 cord of wood? (Cord = 4 feet by 8 feet by 4 feet. A typical cord has 20% air because of unused stacking space.)
Activity 15-7: Volume of Spheres

https://www.youtube.com/watch?v=YNutS8ehEs&app=desktop

Volume of a Sphere

\[ V = \frac{4}{3} \pi r^3 \]

Find the volume of each sphere. Round your answer to the nearest tenth if necessary. Use 3.14 for \( \pi \). Show your work.

1. \( r = 5 \text{ in.} \)

2. \( d = 2.4 \text{ m} \)

3. \( r = 3 \text{ inches} \)

4. \( d = 9 \text{ feet} \)

5. \( r = 1.5 \text{ meters} \)

6. A globe is a map of Earth shaped as a sphere. What is the volume to the nearest tenth of a globe with a diameter of 16 inches?

7. The maximum diameter of a bowling ball is 8.6 inches. What is the volume to the nearest tenth of a bowling ball with this diameter?

8. According to the National Collegiate Athletic Association men’s rules, a tennis ball must have a diameter of more than \( 2\frac{1}{2} \) inches and less than \( 2\frac{5}{8} \) inches. What is the volume of a sphere with a diameter of \( 2\frac{1}{2} \) inches?

9. In the problem above, what is the volume of a mini-tennis ball with a diameter of 2 inches?

10. In the problems above, write an inequality that expresses the range in the volume of acceptable tennis balls.

11. A regulation NBA basketball has a diameter of 9.4 inches. What is the volume of one of these basketballs? Round to the nearest tenth.
Activity 15-8: **Volume of Spheres**  

**Sphere Formula:** Volume = ________________

Find the volume of each solid below. Round answers to the nearest tenth.

1.  
2.  
3.  

4.  
5.  
6.  

7. Approximately how many times as great is the volume of the grapefruit as the volume of the lime?

8. Find the volume of a sphere with a circumference of $36\pi$ ft.

9. You have a glass sphere filled with water fitting exactly into a cubical box (see picture to the right), the width and height of which exactly match the diameter of the sphere. If you break the glass sphere and pour the water into the cube, how much of the cube’s volume will be filled with water?
Round all answers to the nearest hundredths place unless otherwise directed.

Several students went to Baskin-Robbins to get ice cream. They found that the diameter of the scoop of ice cream was 3 inches. The cup and cone both had a diameter of 3 inches and a height of 4.5 inches.

1. What is the volume of the cone? What is the volume of the cup?

2. What is the volume of the scoop of ice cream?

3. Will either or both of the containers hold the packed ice cream?

4. What is the ratio (x:1) of the cup’s volume to the scoop of ice cream’s volume? Explain what this means.

5. What is the ratio (x:1) of the cone’s volume to the scoop of ice cream’s volume? Explain what this means.

Some students decide they want two scoops in a cone and wonder what the height of the cone would have to be to hold two scoops of packed ice cream. The diameter of the cone is still 3 inches.

6. What is the volume of two scoops of ice cream?

7. If the radius of the cone remains the same, what must the height of the cone be so that the two scoops of packed ice cream will fill the cone without excess? Is this a reasonable height for an ice cream cone? Why or why not?

8. The cylindrical container of ice cream has a diameter of 5 inches and a height of 7.25 inches. What is its volume?

9. The product label claims that the container holds 14 scoops of ice cream with each scoop having a diameter of 3 inches. How many scoops of ice cream will the container really hold?
10. A different group of students decided to go to Dairy Queen instead and get Blizzards. They saw four sizes listed with the following prices:

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Mini - $2.55</td>
<td>The Small - $3.25</td>
</tr>
<tr>
<td>The Medium - $3.80</td>
<td>The Large - $4.65</td>
</tr>
</tbody>
</table>

Cylindrical cup sizes

<table>
<thead>
<tr>
<th></th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Mini – 7.2 cm high and 5.5 cm diameter</td>
<td>The Small – 8.3 cm high and 6.3 cm diameter</td>
</tr>
<tr>
<td>The Medium – 11 cm high and 6.5 cm diameter</td>
<td>The Large – 16 cm high and 6 cm diameter</td>
</tr>
</tbody>
</table>

If they wanted to get the most Blizzard for their money, then which size should they buy? Complete the table below to find out.

<table>
<thead>
<tr>
<th></th>
<th>Volume (hundredth)</th>
<th>Cost (ten-thousandth)</th>
<th>$ per cm$³ (ten-thousandth)</th>
<th>cm$³$ per $ (ten-thousandth)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Activity 15-11: **Surface Area of Prisms & Cylinders**

**Surface Area**

- **Prism**
  
  \[ S = Ph \]

- **Cylinder**
  
  \[ S = 2\pi rh \]

**Find the surface area of each prism.**

1. 

2. 

3. 

4. 

5. Marita is decorating the prism at the right with tiles. Each tile is 1 square foot. Each tile costs $0.45. How much will it cost Marita to tile the whole prism?

**Find lateral surface area and total surface area of the cylinders.**

6. 

7.

https://www.youtube.com/watch?v=yJZ5RJxfRIc

Created by Lance Mangham, 6th grade math, Carroll ISD
The surface area of a polyhedron is the sum of the areas of its faces. The surface area of a cylinder is the sum of twice the area of the base and the product of the base’s circumference and the height.

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

1. Find the surface area of a stack of CDs.

2. Find the surface area of a cylinder that has a radius of 5 feet and a height of 8 feet.

Sketch a cylinder with radius \(r\) and height \(h\). Then find its surface area. Use 3.14 for pi.

3. \(r = 4\) cm, \(h = 8\) cm

4. \(r = 10\) cm, \(h = 12\) cm

5. \(r = 3\) ft, \(h = 21\) ft

6-8. For the three shapes below, find the surface area. Use 3.14 for pi.

9. A factory specializes in producing plastic, cylindrical tennis ball cans. It can produce 2000 cans per day. Each can has a diameter of \(4\frac{2}{5}\) inches and a height of 11 inches. How many square inches of plastic does the factory use per day to make the cans? Assume plastic is used for all the lateral area plus one base.

10. If the factory also produces paper labels for the cans, what is the area of one label?
### Activity 15-13: Volume and Surface Area of Cylinders

Name: [Student Name]

Solve the following application problems. Draw a picture to help you.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong></td>
<td>Campbell’s soup company is having a contest for students at DIS to redesign the label for the chicken noodle soup. If the diameter of the can is 3 in, and the height is 4 in, how much paper do students need to create their design?</td>
</tr>
<tr>
<td><strong>2.</strong></td>
<td>Susan has a fish tank in the shape of a cylinder that is 26 inches tall. The diameter of the tank is 12 inches. If there are 2 inches of rocks in the bottom, how much water is needed to fill the tank?</td>
</tr>
</tbody>
</table>

3. \( V = \) _________

4. \( V = \) _________

Find the surface area of each figure. Don’t forget to include units!

5. [Diagram of a cylinder with dimensions 4 m and 5 m]

6. [Diagram of a cylinder with dimensions 4 in and 5 in]

7-9: Find the lateral surface area of each cylinder.

10-12: Find the total surface area of each cylinder.

Round your answers to the nearest tenth, if necessary. Use 3.14 for \( \pi \).

7. [Diagram of a cylinder with dimensions 6 in and 12 in]

8. [Diagram of a cylinder with dimensions 3 ft and 9 ft]

9. [Diagram of a cylinder with dimensions 5 cm and 10 cm]

10. [Diagram of a cylinder with dimensions 1 in and 5 in]

11. [Diagram of a cylinder with dimensions 4 cm and 6 cm]

12. [Diagram of a cylinder with dimensions 8 in and 10 in]
The Buffalo snowstorm has buried the Bills’ Ralph Wilson Stadium

In November 2014 Buffalo, NY was hit with multiple snowstorms that ended up dumping about 5 feet of snow on Ralph Wilson Stadium. The Buffalo Bills were to play the New York Jets that following Sunday and the ground crew had no idea if they would be able to get the stadium ready in time for the game. Here are some headlines about the event:

*The Bills estimate they will need to remove 220,000 tons of snow to clear the stadium for Sunday's game. The team is seeking at least 500 fans -- working on three shifts -- to shovel out the stadium. In return, the Bills will pay fans $10 per hour and offer free game tickets.*

Assuming one person was shoveling at a rate of two scoops per minute, it’d take about 33.5 years to entirely clear the stadium.

If 500 people show up to shovel, it’d take them each about 35,200 scoops to clear the whole stadium. But at that rate, it’ll still take three and a half weeks to clear the stadium.

Let’s use some math to determine if the statements above make sense.

Conversions we need to know:

<table>
<thead>
<tr>
<th>Conversion</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 acre = 4840 square yards</td>
<td>$A = \pi r^2$</td>
</tr>
<tr>
<td>1 square yard = 9 square feet</td>
<td>1 cubic yard = 27 cubic feet</td>
</tr>
<tr>
<td>$V = \pi r^2h$ (cylinder)</td>
<td>$V = lwh$ (rectangular prism)</td>
</tr>
</tbody>
</table>

You may use a calculator for all math involved with this project.
<table>
<thead>
<tr>
<th></th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>How big is Ralph Wilson Stadium?</strong>&lt;br&gt;Ralph Wilson Stadium is an oval. However, you can estimate the area of the stadium using a circle with a radius of 365 feet. What is the area inside the stadium in square feet? In square yards? In acres?</td>
</tr>
<tr>
<td>2.</td>
<td><strong>How much is one ton of snow?</strong>&lt;br&gt;One ton of snow can vary quite a bit depending on how wet or dry the snow is. For our purposes we will estimate one ton on snow to be a block of snow 10 ft. by 20 ft. by 1 ft. deep. What is the volume of one ton of snow?</td>
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<td>3.</td>
<td><strong>What is the volume of the snow that fell?</strong>&lt;br&gt;We need to determine the entire volume of snow inside the stadium. They estimated that 5 feet of snow fell. What is the volume of snow inside the stadium in cubic feet? In cubic yards?</td>
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<td>4.</td>
<td><strong>In tons, how much does all the snow inside the stadium weigh?</strong></td>
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<tr>
<td>5.</td>
<td>How does your estimate compare to the Bills’ estimate on the front page?</td>
</tr>
<tr>
<td>6.</td>
<td><strong>How fast can people shovel?</strong>&lt;br&gt;Let’s assume an average person can shovel twice per minute with each shovel holding 10 pounds of snow. How many pounds of snow can one person shovel in an hour? How long would it take one person to shovel the entire stadium (months)? How long would it take 500 people to shovel the entire stadium (hours)? How long would it take 3,000 volunteers to shovel the entire stadium (hours)?</td>
</tr>
<tr>
<td>7.</td>
<td>How does your one-person estimate compare to the Bills’ estimate on the front page?</td>
</tr>
<tr>
<td>8.</td>
<td>How does your 500-person estimate compare to the Bills’ estimate on the front page?</td>
</tr>
<tr>
<td>9.</td>
<td><strong>What about the entire Ralph Wilson Stadium Complex?</strong>&lt;br&gt;Ralph Wilson Stadium is only one part of the entire area that would need to be cleared. Volunteers would also need to clear the parking lots, nearby street, sidewalks, etc. The entire Ralph Wilson Stadium Complex is 197 acres. Based on this information, what would be the total weight of the snow the volunteers would need to remove?</td>
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<tr>
<td>10.</td>
<td>How does your new estimate compare to the Bills’ estimate on the front page?</td>
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<tr>
<td>11.</td>
<td>How long would it take one person to shovel the entire complex (years)?</td>
</tr>
<tr>
<td>12.</td>
<td>How does your new estimate compare to the Bills’ estimate on the front page?</td>
</tr>
<tr>
<td>13.</td>
<td>The Bills offered to pay fans $10 an hour. How much money would the Bills have paid in total to clear the entire complex?</td>
</tr>
</tbody>
</table>