[NOTE: be ready to explain circumference, circle area, cylinder and/or cone surface area for real assessment]

1. Explain why the area of a circle with radius $r$ can be found by $\mathrm{A}=\pi * r^{2}$. You may use diagrams to accompany your explanation.
2. Label each part correctly. Then give the full formula for cylinder surface area.


GMD-A1b
[NOTE: be ready to explain volume formulas for cylinders, cones, and prisms for this skill on real assessment.]
3. Explain why the volume of a cylinder can be found with $V=\pi * r^{2} * h$. You may use diagrams to accompany your explanation.
4. Explain why the volume of a cone with radius $r$ and height $h$ can be found by $\mathrm{V}=\frac{1}{3} * \pi * r^{2} * h$ You may use diagrams to accompany your explanation.
5. A silo is being used to store excess grain. It is shaped as shown, including a cone. The structure is 60 feet tall in total, 30 feet wide at its base, and the cylindrical portion is 45 feet tall. To the nearest whole number, find the volume of the silo. Include units in your answer.

6. Find the surface area of the exposed portions of the silo pictured above to the nearest whole number. Include units in your answer.

MG-1a
7. Organizers are preparing water for an upcoming race. Each water cooler is a 2 -foot tall cylinder with a 10 -inch diameter. Water is distributed in cone-shaped cups 5 inches tall with a diameter of 4 inches. There are 300 runners and each runner is given 2 drinks. Approximately how many coolers are needed? Show the calculations that lead to your conclusion.

MG-A2a
8. A spherical rock with diameter 2.02 cm is brought to your lab for identification. Its mass is measured on a scale to be 12.6 g . Based on the table below, find the most likely category for the rock.

| Type | Density $\left(\mathrm{g} / \mathrm{cm}^{3}\right)$ |
| :--- | :--- |
| Shale | 0.34 |
| Graphite | 2.23 |
| Talc | 2.92 |
| Pyrite | 5.02 |

9. Find the missing data values in the table. Round each to the nearest whole number.

| Country | Total Population | Area $\left(\mathrm{km}^{2}\right)$ | Density $\left(\right.$ people $\left./ \mathrm{km}^{2}\right)$ |
| :--- | :--- | :--- | :--- |
| Peru |  | $1,285,000$ | 23 |
| Morocco | $34,000,000$ | 450,000 |  |
| Laos | $6,800,000$ |  | 27 |

