*** It is important to note that just like estimating non perfect square roots, sometimes we can estimate the volume by using an estimated value (3.14) for π.*

Practice: Find the volume of the figures below. For even numbers, use 3.14 for pi to estimate the volume.

1)

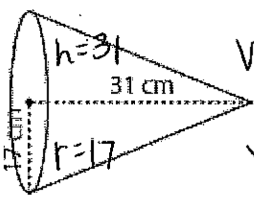
$V=\frac{1}{3}\pi r^2 h$

$V=\frac{1}{3}\pi \cdot 17^2 \cdot 31$

$V=\frac{1}{3}\pi \cdot 289 \cdot 31$

$V=\frac{1}{3}\pi \cdot 8959$

$V=\frac{8959}{3}\pi$



$V \approx (8959 \div 3) \times 3.14$

Volume = $9377.1\ cm^3$

2)

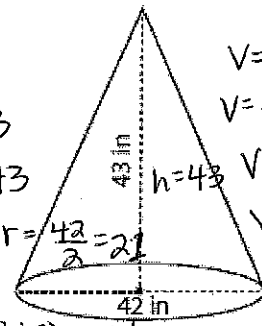
$V=\frac{1}{3}\pi r^2 h$

$V=\frac{1}{3}\pi \cdot 21^2 \cdot 43$

$V=\frac{1}{3}\pi \cdot 441 \cdot 43$

$V=\frac{18963}{3}\pi$

$r=\frac{42}{2}=21$



$V \approx (18963 \div 3) \times 3.14$

Volume = $19\,847.94\ in^3$

3)

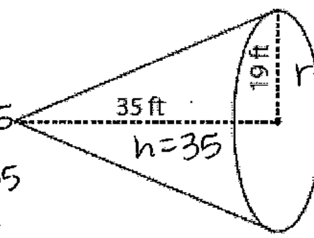
$V=\frac{1}{3}\pi r^2 h$

$V=\frac{1}{3}\pi \cdot 19^2 \cdot 35$

$V=\frac{1}{3}\pi \cdot 361 \cdot 35$

$V=\frac{1}{3}\pi \cdot 12635$

$V=\frac{12635}{3}\pi$



$V \approx (12635 \div 3) \times 3.14$

Volume = $13224.6\ ft^3$

4)

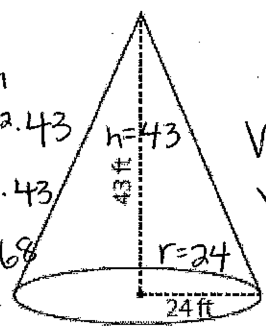
$V=\frac{1}{3}\pi r^2 h$

$V=\frac{1}{3}\pi \cdot 24^2 \cdot 43$

$V=\frac{1}{3}\pi \cdot 576 \cdot 43$

$V=\frac{1}{3}\pi \cdot 24768$

$V=\frac{24768}{3}\pi$



$V \approx (24768 \div 3) \times 3.14$

Volume = $25923.8\ ft^3$

5)

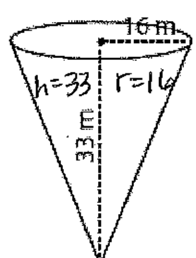
$V=\frac{1}{3}\pi r^2 h$

$V=\frac{1}{3}\pi \cdot 16^2 \cdot 33$

$V=\frac{1}{3}\pi \cdot 256 \cdot 33$

$V=\frac{1}{3}\pi \cdot 8448$

$V=\frac{8448}{3}\pi \approx (8448 \div 3) \times 3.14$



Volume = $8842.24\ m^3$

6)

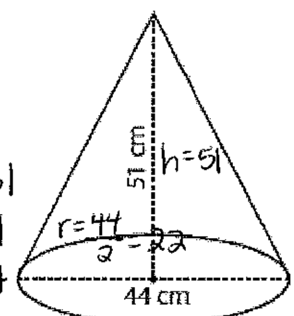
$V=\frac{1}{3}\pi r^2 h$

$V=\frac{1}{3}\pi \cdot 22^2 \cdot 51$

$V=\frac{1}{3}\pi \cdot 484 \cdot 51$

$V=\frac{1}{3}\pi \cdot 24684$

$V=\frac{24684}{3}\pi \approx (24684 \div 3) \times 3.14$



Volume = $25835.9\ cm^3$

A movie theater is considering switching their cylindrical popcorn buckets for a cone shaped container with the same height and radius. How would this change the amount of popcorn the consumer is getting? To be fair, how much would the movie theater need to reduce the cost of the popcorn? Explain your answer below.

The cylindrical popcorn is three times that of a cone. This means the cone is $\frac{1}{3}$ the size of the cylinder, so they should reduce their cost by $\frac{1}{3}$. They could do this by multiplying by $\frac{1}{3}$ or by dividing by 3.