

**2024A7****VOLUME, UNIT CONVERSIONS**

Level 1:

$$r = \frac{1}{2} D$$

$$r = \frac{1}{2} * (60 \text{ ft})$$

$$r = 30 \text{ ft}$$

$$V_{cylinder} = \pi r^2 h$$

$$V_{cylinder} = \pi * (30 \text{ ft})^2 * (8 \text{ ft})$$

$$V_{cylinder} = 22,619.47 \text{ ft}^3$$

$$\text{digging rate} = \frac{10 \text{ min} + 5 \text{ min}}{1200 \text{ ft}^3}$$

$$\text{digging rate} = \frac{15 \text{ min}}{1200 \text{ ft}^3}$$

$$\text{digging time} = \text{digging rate} * V_{cylinder}$$

$$\text{digging time} = \frac{15 \text{ min}}{1200 \text{ ft}^3} * (22,619.47 \text{ ft}^3)$$

$$\text{digging time} = 282.74 \text{ min}$$

$$\text{digging time} = \frac{1 \text{ hr}}{60 \text{ min}} * (282.74 \text{ min})$$

$$\text{digging time} = 4.71 \text{ hr}$$

Remember! So far, we've only calculated for one foundation, but this client wants three.

$$\text{total digging time} = \text{digging time} * \text{number of excavations}$$

$$\text{total digging time} = 4.71 \text{ hr} * 3$$

$$\text{total digging time} = 14.13 \text{ hr}$$

**Level 2:**

$$part = \frac{\text{percentage}}{100} \text{whole}$$

$$\text{volume of stone} = \frac{\text{percent of stone}}{100} V_{\text{cylinder}}$$

$$\text{volume of stone} = \frac{23\%}{100} * (22619.47 \text{ ft}^3 * 3 \text{ cylinders})$$

$$\text{volume of stone} = 15,607.43 \text{ ft}^3$$

$$\text{volume of stone} = (15,607.43 \text{ ft}^3) * \frac{1 \text{ yd}^3}{27 \text{ ft}^3}$$

$$\text{volume of stone} = 578.05 \text{ yd}^3 \text{ of stone}$$

$$\text{volume of concrete} = \frac{\text{percent of concrete}}{100} V_{\text{cylinder}}$$

$$\text{volume of concrete} = \frac{77\%}{100} * (22619.47 \text{ ft}^3 * 3 \text{ cylinders})$$

$$\text{volume of concrete} = 52,250.98 \text{ ft}^3$$

$$\text{volume of concrete} = (52,250.98 \text{ ft}^3) * \frac{1 \text{ yd}^3}{27 \text{ ft}^3}$$

$$\text{volume of concrete} = 1935.22 \text{ yd}^3 \text{ of concrete}$$