

# Ans. Key

## Math 2551 Exercise 15

Section:

Name:

Student ID:

The gas tank of a truck is cylindrical. Mark "true" or "false" for each of the following statements.

False

(1) If the diameter of the gas tank increases by 1%, then its volume increases by about 1%.

False

(2) If the diameter of the gas tank increases by 1% and the length of the gas tank increases by 1%, then its volume increases by about 2%.



$$\begin{aligned} V &= \pi \left(\frac{a}{2}\right)^2 h = \frac{1}{4} \pi a^2 h \\ \Rightarrow dV &= \frac{\partial V}{\partial a} da + \frac{\partial V}{\partial h} dh \\ &= \frac{1}{2} \pi a h da + \frac{1}{4} \pi a^2 dh \\ \Rightarrow \frac{dV}{V} &= 2 \frac{da}{a} + \frac{dh}{h} \end{aligned}$$

$$(1) \frac{da}{a} = 0.01, \frac{dh}{h} = 0 \Rightarrow \frac{dV}{V} = 0.02$$

$$(2) \frac{da}{a} = 0.01, \frac{dh}{h} = 0.01 \Rightarrow \frac{dV}{V} = 0.03$$