

27 c)

T	R
7.6	5.8
30	15
380	78
930	143

Red annotations: A bracket on the left side of the table groups the values 30, 380, and 930, with a red arrow pointing to the value 31. A bracket on the right side of the table groups the values 15, 78, and 143, with a red arrow pointing to the value 9.53.

$$2^x = 8$$

$$9.5\bar{3}^x = 31$$

$$\log 9.5\bar{3}^x = \log 31$$

$$x \log 9.5\bar{3} = \log 31$$

$$x = \frac{\log 31}{\log 9.5\bar{3}}$$

$$x = 1.5229 \dots$$

$$x \doteq 1.5$$

$$T \propto R^{1.5}$$

$$T \propto R^{\frac{3}{2}}$$

$$T^2 \propto R^3$$

Using Proportioning Techniques in Physics

① Determine the specific equation relating 2 or more variables once the proportionality is known

② Forming the proportionality from the equation

$$a_c = \frac{4\pi^2 R}{T^2}$$

$$a_c \propto R \quad a_c \propto \frac{1}{T^2}$$

$$F_g = \frac{G m_1 m_2}{r^2}$$

$$F_g \propto m_1 \quad F_g \propto m_2 \quad F_g \propto \frac{1}{r^2}$$

③ Solving Problems Using Proportioning Technique

Sample Problem

1. $F \propto v^2$

let $v' = 3v$
 F' be the new
 F .

$$F = kv^2$$

$$F' = k(v')^2$$

$$F' = k(3v)^2$$

$$F' = k \cdot 9v^2$$

$$F' = 9kv^2$$

$$F' = 9F$$

$kv^2 = F$
 (the original)
 force

← the new force will be 9 times greater than the original.

$$2. \quad V = \pi r^2 h$$

$$V' = \pi (r')^2 h'$$

$$V' = \pi (2r)^2 (2h)$$

$$V' = \pi (4r^2)(2h)$$

$$V' = 8 \pi r^2 h \rightarrow V$$

$$V' = 8V$$

$$V' = 8(1.0 \times 10^5 \text{ L})$$

$$V' = 8.0 \times 10^5 \text{ L}$$

← The new volume will be 8 times the original.

TO DO

① PP/30

② Assignment p38/28-34 35+36
ADV

(due Thurs)

③ Quiz - Tues