Prof. Kincade – January 25

2.5 – Variation

Constant
V

- y varies directly as x $\Rightarrow$ $y = kx$
- y varies inversely as x $\Rightarrow$ $y = \frac{k}{x}$
- y varies jointly as x and z $\Rightarrow$ $y = k \cdot xz$

* Making a model, and then using it to project or predict things.

The Procedure

1. Set up the equation with constant k
2. Use appropriate data to find k (initial conditions)
3. rewrite the equation, replacing k with its new value.
4. Find the requested information.

{Try making your own procedure so as not to miss any steps!}

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1. 'V' varies directly with 't'. $V = 16$ when $t = 2$.

→ $y = kx \Rightarrow V = kt$ {we need to find k. so what do we need? In this case, V and t, so I can solve for the last missing thing!

→ $16 = k(2) \Rightarrow \boxed{8 = k}$

→ $\boxed{V = 8t}$

#6

(8) y varies inversely with $\sqrt{x}$. $y = 4$ when $x = 9$.

$\rightarrow y = \frac{k}{x} \longrightarrow y = \frac{k}{\sqrt{x}}$

$\rightarrow 4 = \frac{k}{\sqrt{9}} \longrightarrow 4 = \frac{k}{3} \Rightarrow \boxed{12 = k}$

$\rightarrow$ Rewrite $\Rightarrow \boxed{y = \frac{12}{\sqrt{x}}}$

(Cube root of x) (the square of d)

10) T varies jointly as $\sqrt[3]{x}$ and d^2.
$T = 18$ when $x = 8$ and $d = 3$.

$\rightarrow y = k \cdot xz \longrightarrow T = k \cdot \sqrt[3]{x} \cdot d^2$

$\rightarrow 18 = k \cdot \sqrt[3]{8} \cdot (3)^2$
$18 = k \cdot 2 \cdot 9 \Rightarrow 18 = k \cdot 18 \Rightarrow \boxed{k = 1}$

$\rightarrow T = \sqrt[3]{x} \cdot d^2$

(32) P. 193 in sullivan text book. . . . . .

Information: current $= i$ amperes
resistance $= z$ ohms
$\boxed{y = \frac{k}{x}}$ • Current is inversely proportional to resistance

$\rightarrow i = \frac{k}{z}$; $i = 30$, $z = 8$

$30 = \frac{k}{8} \Longrightarrow 240 = k$

$\rightarrow \boxed{i = \frac{240}{z}} \Rightarrow$ if $z = 10$, then...

$\rightarrow i = \frac{240}{10} = 24$ amperes