

Analyzing Data using proportioning technique

| | | | | | | | |
|------|----|----|----|-----|-----|-----|-----|
| t(s) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| d(m) | 28 | 56 | 84 | 112 | 140 | 168 | 196 |

Red arrows: 1 to 2 (x2), 2 to 4 (x2), 4 to 6 (x2)
 Blue arrows: 1 to 5 (x5), 5 to 6 (x1.2)
 Green arrows: 2 to 6 (x3), 3 to 6 (x2)

$d \propto t$


 $d = kt$

$k = \frac{d}{t}$

$k = \frac{56m}{2s}$

$k = 28 m/s$

$k = 3 \times 10^1 m/s$

$d = (3 \times 10^1 m/s) t$

| | | | | | | |
|-------|-----|-----|------|------|-------|------|
| f(Hz) | 5 | 10 | 20 | 50 | 75 | 100 |
| T(s) | 0.2 | 0.1 | 0.05 | 0.02 | 0.013 | 0.01 |

Red arrows: 5 to 10 (x2), 10 to 0.1 (x1/10)
 Blue arrows: 5 to 100 (x20), 10 to 100 (x10)
 Green arrows: 10 to 0.05 (x1/2), 10 to 0.01 (x1/10)

$T \propto \frac{1}{f}$

Sample Problems

1.

| x | y |
|------|----|
| 250 | 3 |
| 750 | 9 |
| 2500 | 30 |
| 5000 | 60 |

Annotations: $\times 3$ (red), $\times 10$ (green), $\times 20$ (blue)

$y \propto x$

2.

| A | B |
|------|-----|
| 20 | 14 |
| 80 | 28 |
| 180 | 42 |
| 2000 | 140 |

Annotations: $\times 4$ (red), $\times 9$ (green), $\times 100$ (blue), $\times 2$ (red), $\times 3$ (green), $\times 10$ (blue)

$A \propto B^2 \quad B^2 \propto A$

$\sqrt{A} \propto B$

↑ need square

3.

| F | r |
|-----|----|
| 900 | 1 |
| 225 | 2 |
| 36 | 5 |
| 14 | 18 |
| 1 | 30 |

Annotations: $\frac{1}{4}$ (red), $\frac{1}{25}$ (green), $\frac{1}{900}$ (blue), $\times 2$ (red), $\times 5$ (green), $\times 30$ (blue)

$F \propto \frac{1}{r^2}$

HW

- ① Practice on p23 (FOP)
- ② p38 | 26 + 27

- state proportionality
- general eq
- find k
- write specific eq.

$B^{10} \propto A^3$

