

### 7.2 Modeling Direct Variation

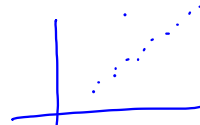
Drop	Bounce	Ratio $\frac{B}{D}$
20	15	0.75
30	24	0.8
40	32.5	0.8125
50	41	0.82
60	48.5	0.808 $\bar{3}$

All close to 0.8

Direct Variation is a description of two quantities that have a consistent ratio when compared

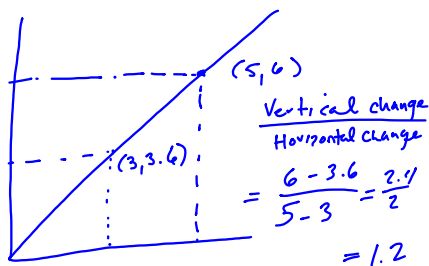
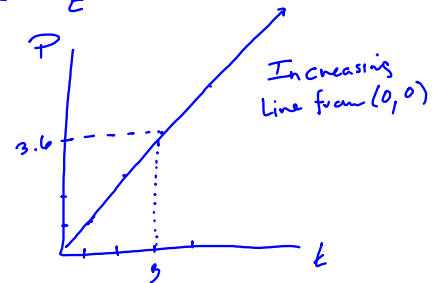
Not exact  
Real world examples we look for pattern

t	P	$\frac{P}{t}$
85	100	1.18
39	50	1.28
24	29	1.21
60	95	1.58 ←
70	90	1.29



If 60, 95 was not there then it would be direct variation

$$1.2 = \frac{P}{t}$$



Slope of the graph is the ratio of quantities

$$\frac{y}{x}$$

$$\frac{a}{b} = 5.1 \quad a = 23$$

$$b \left( \frac{23}{b} = 5.1 \right) b$$

$$\frac{23}{5.1} = \frac{5.1b}{5.1}$$

$$4.5 = b$$

$$\frac{a}{b} = 5.1 \quad b = 2.3$$

$$\frac{a}{2.3} = 5.1$$

$$a = 5.1 \cdot 2.3$$

$$a = 11.73$$

A model shows  
direct variation  
if the quotient is consistent

$$\frac{y}{x}$$