

5.1 Direct Variation

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pg 242 # 1, 3, 7, 8, 9, 12, 13

a) independent is time, dependent is distance

$$k = \frac{y}{x} \text{ so } k = \frac{d}{t} \quad k = \frac{240}{3} = 80$$

b) independent is # books, depend. is cost

$$k = \frac{y}{x} \quad k = \frac{35}{5} \quad k = 7$$

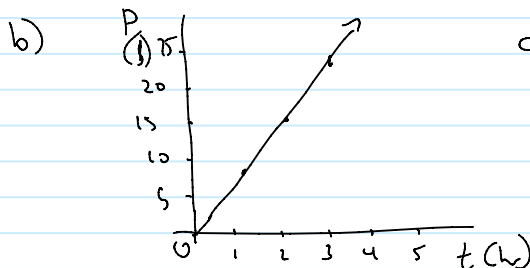
c) independent is time, depend is volume

$$k = \frac{y}{x} \quad k = \frac{500}{5} \quad k = 100$$

3. pay (\$) varies directly with time (h) pay is \$8/hr

a) let P be pay (dependent) and let t be time (independent)

t	P
0	0
1	8
2	16
3	24

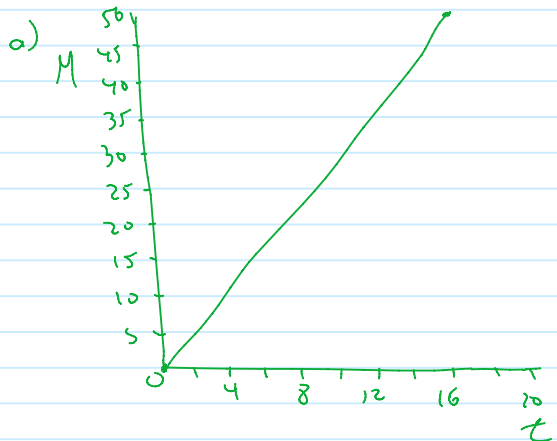


c) $P = 8t$

7. money (dep) varies with time (ind)

Tania: \$50 for 16 hr

$$k = \frac{y}{x} = \frac{50}{16} = 3.125$$



b) $M = 3.125t$

c) What is M when t is 24?

$$M = 3.125t = 3.125(24) = 75$$

She raised \$75 in 24 hr

8. \$9.50/hr is regular $9.50 \times 1.5 = \$14.25$ overtime

let P be pay and t be number hours

regular: $P = 9.5t$
overtime: $P = 14.25t$

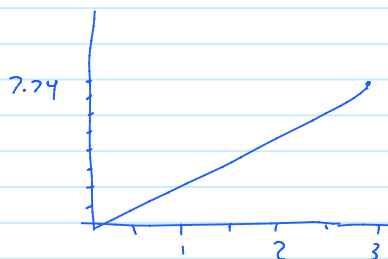
If his pay becomes \$10, his regular is $P = 10t$

$10 \times 1.5 = 15$ Overtime is now $P = 15t$

9. 0.5 kg sugar is \$1.29

This is direct variation because for every 0.5 kg increase the cost goes up by \$1.29

$$k = \frac{y}{x} = \frac{1.29}{0.5} = 2.58$$



If sugar went up to $1.49/0.5$ kg $k = \frac{1.49}{0.5} = 2.98$

the graph would be steeper

12. Volume varies with time $k = \frac{V}{t}$
let V be volume of water
(let t be time min)
 $= \frac{500L}{4min}$
 $= 125$

a) $V = 125t$

k , 125, represents volume of water in each minute

c) what is V when $t = 20$ min? $V = 125t$
 $= 125(20)$
 $= 2500L$

d) how long to fill 115000L? $V = 125t$ It will take 920 min
 $115000 = 125t$
 $\frac{115000}{125} = t$
 $920 = t$

e) If 400L is in the pool after 4 min, k would be $\frac{400}{4} = 100$.
the graph would be less steep. The equation would be $V = 100t$

13. Freezing point (F) varies with salt content (S)

Ocean salt of 3.5% freezes at $-2^\circ C$.

a) independent variable is salt content

b) $k = \frac{y}{x}$ $k = \frac{F}{S}$ $k = \frac{-2}{3.5}$ $k = -0.57$ so $F = -0.57S$

c) Find T when S is 1 : $F = -0.57S$
 $= -0.57(1)$
 $= -0.57$ It freezes at $-0.57^\circ C$

d) Find S when T is $-3^\circ C$: $F = -0.57S$
 $-3 = -0.57S$
 $\frac{-3}{-0.57} = S$
 $5.3 = S$

a salt content of 5.3% freezes at $-3^\circ C$