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* Variation (Cont.)

Problem 22)

$I = \frac{1}{d^2} \cdot K \qquad I = K \cdot \frac{1}{d^2} \qquad I = \frac{K}{d^2}$

$I = 0.065 \quad d = 2$

$0.065 = K \cdot \frac{1}{2^2}$

$\frac{4}{1} \cdot 0.065 = K \cdot \frac{1}{4} \cdot \frac{4}{1}$

$0.26 = K$

$\therefore \quad I = 0.26 \cdot \frac{1}{d^2}$

Find I when d is 5

$I = 0.26 \cdot \frac{1}{25} \rightarrow 5^2$

$I = \frac{0.26}{1} \times \frac{1}{25}$

$I = \frac{0.26}{25}$

$I = 0.0104$ foot-candles

Problem 23

Quantity	Units	Variable
Power (Horsepower)	hp	P
Angular Velocity (Speed)	rpm	(w)
Diameter	inches	d

P varies jointly with w and d^3

$P = K \cdot \frac{w \cdot d^3}{1}$

$P = K w d^3$

$P = K \cdot w d^3$

$P = 36 \quad w = 75 \quad d = 2$

$36 = K \cdot 75 \cdot 8$

$36 = 600K$

$\frac{36}{600} = K \qquad K = \frac{3}{50}$

$P = \frac{3}{50} w d^3$

$P = 130 \quad w = 80$

$130 = \frac{3}{50} \cdot 80 \cdot d^3$

$50 \cdot 130 = 3 \cdot 80 \cdot d^3$

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* Variation (cont.)

Problem 22)

$I = \frac{1}{d^2} \cdot K \qquad I = K \cdot \frac{1}{d^2} \qquad I = \frac{K}{d^2}$

$I = 0.065 \quad d = 2$

$0.065 = K \cdot \frac{1}{2^2}$

$\frac{4}{1} \cdot 0.065 = K \cdot \frac{1}{4} \cdot \frac{4}{1}$

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$\therefore \quad I = 0.26 \cdot \frac{1}{d^2}$

Find I when d is 5

$I = 0.26 \cdot \frac{1}{25} \rightarrow 5^2$

$I = \frac{0.26}{1} \times \frac{1}{25}$

$I = \frac{0.26}{25}$

$I = 0.0104$ foot-candles

Problem 23

Quantity	Units	Variable
Power (Horsepower)	hp	P
Angular Velocity (speed)	r.p.m	(e)
Diameter	inches	d

P varies jointly with (e) and d^3

$P = K \cdot \frac{w \cdot d^3}{1}$

$\therefore P = K w d^3$

$P = K \cdot w d^3$

$P = 36 \quad w = 75 \quad d = 2$

$36 = K \cdot 75 \cdot 8$

$36 = 600K$

$\frac{36}{600} = K \qquad K = \frac{3}{50}$

$P = \frac{3}{50} (e) d^3$

$P = 130 \quad w = 80$

$130 = \frac{3}{50} \cdot 80 \cdot d^3$

$50 \cdot 130 = 3 \cdot 80 \cdot d^3$

$6500 = 240d^3$

$\frac{6500}{240} = d^3$

$\sqrt[3]{\frac{6500}{240}} = d$

$d = 3.00308325$ (round just at the end)

$\boxed{d \approx 3 \text{ inches}}$

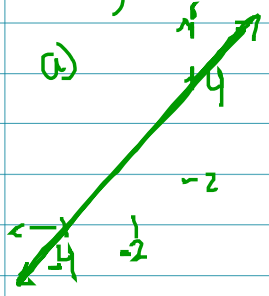
Mini-project II - Reteach

$$f(x) = \begin{cases} x+4 \text{ if } x<0 \text{ (a)} \\ 2 \text{ if } x=0 \\ -x+4 \text{ if } x>0 \text{ (b)} \end{cases}$$

$f(x) = x+4$

$y = x+4$

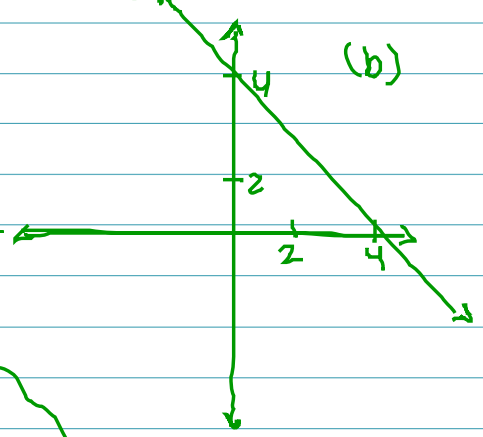
(a)

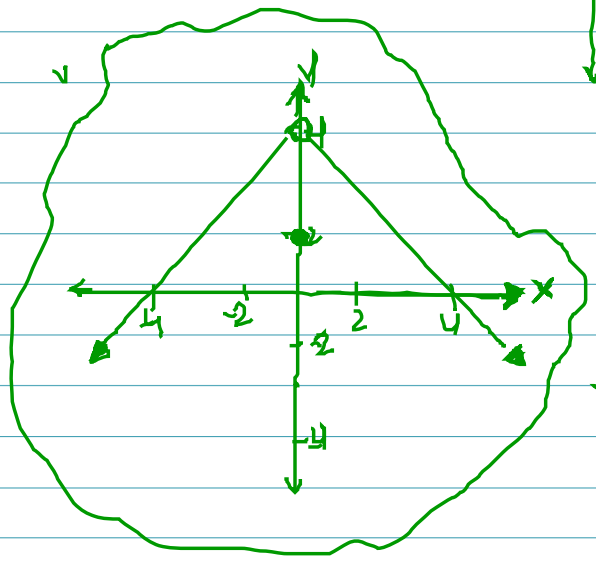


$f(x) = -x+4$

$y = -x+4$

(b)





$$f(x) = \begin{cases} x+4 \text{ if } x<0 \\ 2 \text{ if } x=0 \\ -x+4 \text{ if } x>0 \end{cases}$$

For Miniproject II, part I

Exercise

please listen to the lecture!