

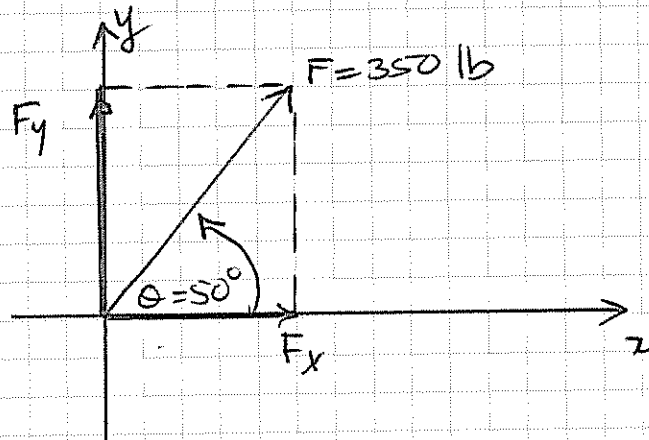
Homework 3.

Sample Solution

1/

Question 1.

a) $F = 350 \text{ lb}$ $\theta = 50^\circ$



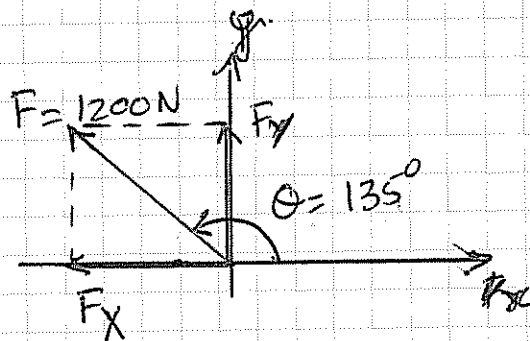
$$F_x = 350 * \cos 50^\circ$$
$$= 225.0 \text{ lb}$$

$$F_y = 350 * \sin 50^\circ$$
$$= 268.1 \text{ lb}$$

b).

$$F = 1200 \text{ N}$$

$$\theta = 135^\circ$$



$$F_x = 1200 * \cos \theta = 1200 \cos 135^\circ$$
$$= -1200 * \cos 45^\circ$$

$$= -848.5$$

$$F_y = 1200 \sin 45^\circ$$

$$= 848.5$$

HWK 3

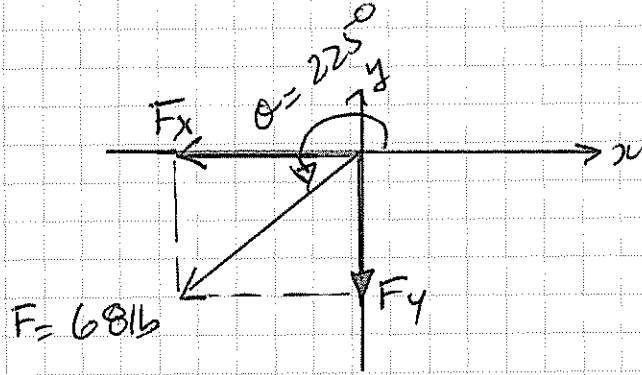
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Q1.

c).

$$F = 68 \text{ lb}$$

$$\theta = 225^\circ$$



$$F_x = -68 * \cos 45$$

$$= -48.1 \text{ lb}$$

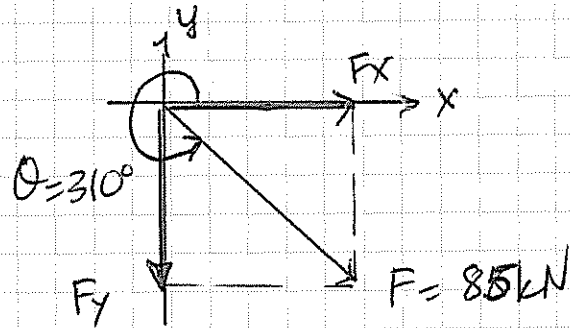
$$F_y = -68 * \sin 45$$

$$= -48.1 \text{ lb}$$

d).

$$F = 85 \text{ kN}$$

$$\theta = 310^\circ$$



$$F_x = 85 * \cos 50$$

$$= 54.6 \text{ kN}$$

$$F_y = -85 * \sin 50$$

$$= -65.1 \text{ kN}$$

EXAMPLE

Force	Magnitude lb	Theta deg	Sin	Cos	Fx f cos(theta) lb	Fy F sin(theta) lb	
A	55	90	1	0.000	0.000	55.0	
B	45	30	0.5	0.866	39.0	22.5	
C	72	330	-0.5	0.866	62.4	-36.0	
D	32	270	-1	0.000	0.0	-32.0	
E	38	210	-0.5	-0.866	-32.9	-19.0	
Resultants						68.4	-9.5

Resultant Magnitude of Force	69.1 lb
Resultant Direction	-7.9 degrees

a)

Force	Magnitude kN	Theta deg	Sin	Cos	Fx f cos(theta) kN	Fy F sin(theta) kN	
A	1.5	90	1	0.000	0.0	1.5	
B	1.3	45	0.707	0.707	0.9	0.9	
C	2.2	-25 (335)	-0.423	0.906	2.0	-0.9	
D	1.1	-115 (245)	-0.906	-0.423	-0.5	-1.0	
E	1.3	-165 (145)	-0.259	-0.966	-1.3	-0.3	
Resultants						1.2	0.2

Resultant Magnitude of Force	1.2 kN
Resultant Direction	7.5 degrees

b)

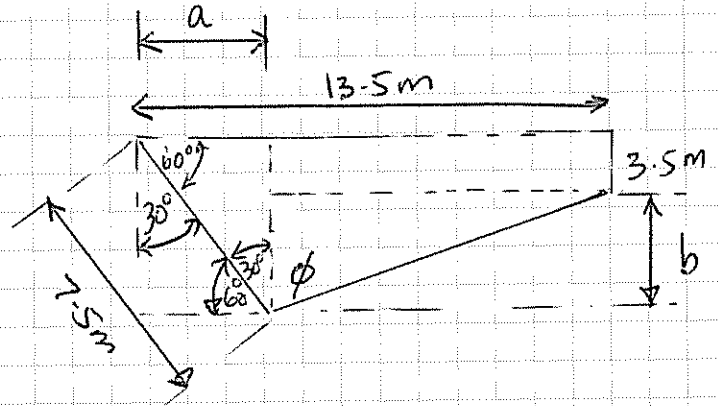
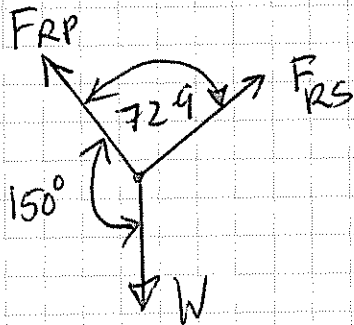
Force	Magnitude lb	Theta deg	Sin	Cos	Fx f cos(theta) lb	Fy F sin(theta) lb	
A	8	90	1	0.000	0.00	8.00	
B	7	60	0.866	0.500	3.50	6.06	
C	12	-30 (330)	-0.500	0.866	10.39	-6.00	
D	5	-90 (270)	-1.000	0.000	0.00	-5.00	
E	6	-135 (225)	-0.707	-0.707	-4.24	-4.24	
Resultants						9.6	-1.2

Resultant Magnitude of Force	9.7 lb
Resultant Direction	-7.0 degrees

HWK 3.

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Q.3.

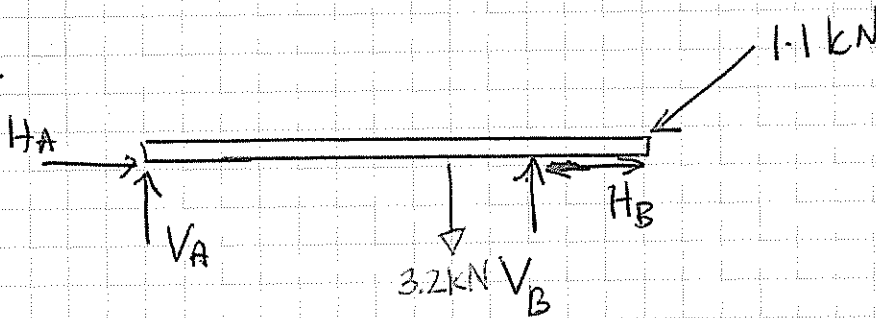


$$a = 7.5 \sin 30^\circ = 3.75 \text{ m}$$

$$b = 7.5 \cos 30^\circ - 3.5 = 3.00 \text{ m}$$

$$\phi = \tan^{-1} \left(\frac{13.5 - a}{b} \right) = 72.9$$

Q4.



260
205
138

150
35
115