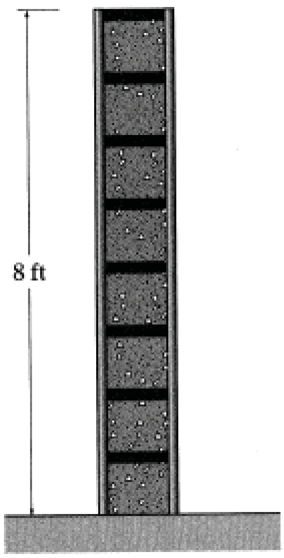
1.   1-2

A building wall consists of 12-in. clay- brick and 2 x 4 unplastered woodstuds on both sides. If the wall is 8 ft high, determine the load in pounds per foot length of wall that it exerts on the floor.



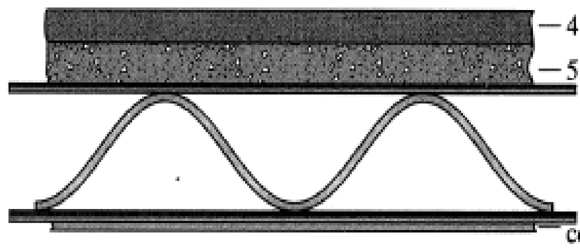
Prob. 1–2

Using the data in Table 1-3,

Minimum Design Dead Load for 12- in clay brick	= 115 psf		
Therefore, for 8 ft high wall			
Dead Load for 12-in clay brick	= 115 psf x 8 ft	= *920 psf*	- 4 Points
Minimum Design Dead Load for			
2 x 4 unplastered Woodstuds	= 4 psf (From Table 1-3)		
For both sides,	= 2(4) psf	= 8 psf	
For 8 ft high wall	= 8 ft (8 psf)	= *64 psf*	- 4 Points
Therefore, Total Design Dead load	= 920 psf + 64 psf		
	= **984 lb/ft Ans**		- 2 Points

2. 1-8

The second floor of a light manufacturing building is constructed from a 5- in. thick stone concrete slab with an added 4- in. cinder concrete fill as shown. If the suspended ceiling of the first floor consists of metal lath and gypsum plaster, determine the dead load for design in pounds per square foot of floor area.



Prob. 1–8

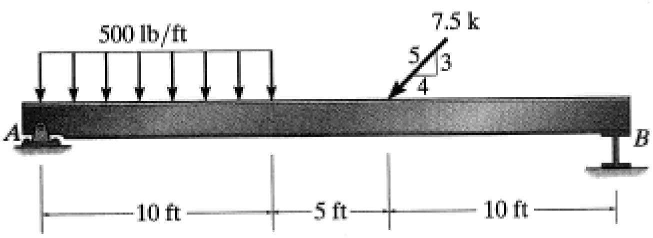
Sol:

Using the data in Table 1-3,

Minimum Design Load for stone concrete, per inch	= 12 psf		
For 5 –in. concrete slab, Design Dead Load	= 12 x 5	= 60 psf	- 4 Points
Minimum Design Dead Load for			
cinder concrete fill, per inch	= 9 psf		
For 4-in. cinder fill, Design Dead Load	= 9 x 4 =	36 psf	- 4 Points
Minimum Design Dead Load for suspended metal			
lath and gypsum	= 10 psf		
Total Design Dead Load	= 60 psf +36 psf +10 psf		
	= 106 lb/ft^2 Ans		- 2 Points

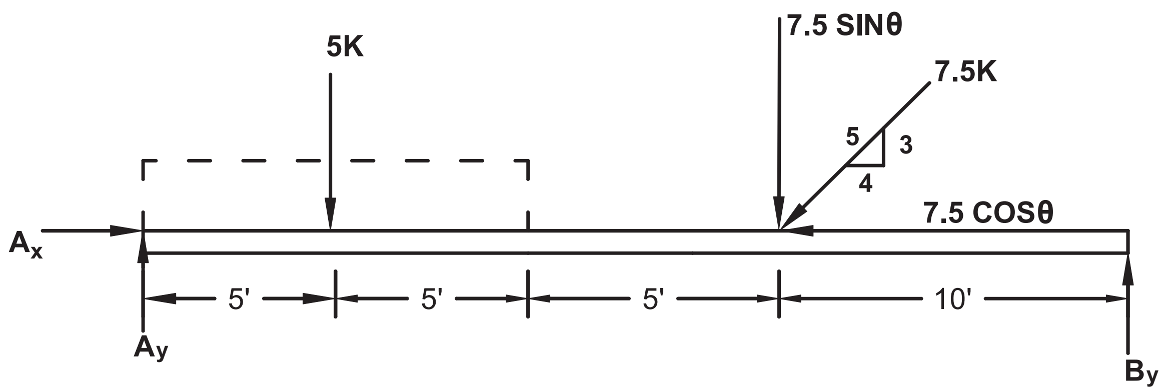
3. 2-18

Determine the reactions on the beam. The support at B can be assumed as a roller.



Prob. 2–18

Sol:



Resolving into x and y components and summing moments about A,

$\circlearrowleft + \Sigma M_A = 0;$ $5(5) + 15(7.5)(3/5) - 25(B_y) = 0$ - 3 Points

$\mathbf{B_y = 3.70\ k}$ **Ans** - 1 Point

$\xrightarrow{+} \Sigma F_X = 0;$ $A_X - (4/5)(7.5) = 0$ - 2 Points

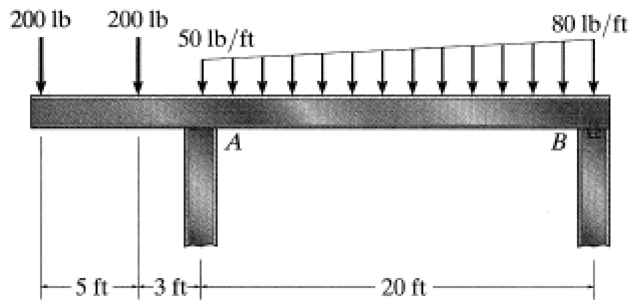
$\mathbf{A_X = 6.00\ k}$ **Ans** - 1 Point

$+\uparrow \Sigma F_y = 0;$ $A_y + B_y - 5 - (3/5)(7.5) = 0$ - 2 Points

$\mathbf{A_y = 5.80\ k}$ **Ans** - 1 Point

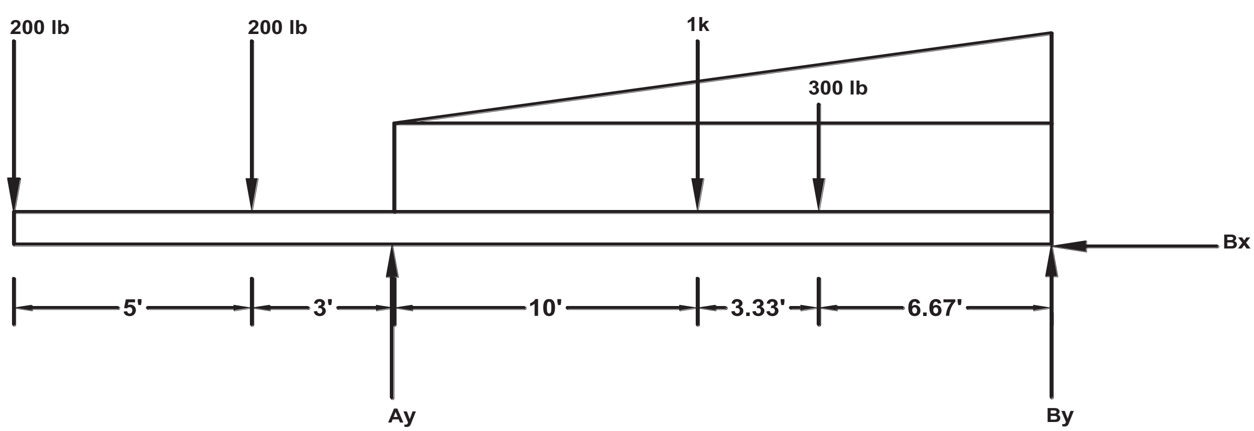
4. 2- 23

Determine the vertical reactions at the supports A and B. Assume A is a roller and B is a pin.



Prob. 2–23

Sol:



Resultant Forces: 1) 50 x 20 = 1000 lb acts 10 ft from right. - 1 Point

2) (½) (30) (20) = 300 lb acts 6.67 ft from right. - 1 Point

↻ $+\Sigma M_B = 0$; $300(6.67) + 1000(10) + 200(23) + 200(28) - A_y(20) = 0$ - 2 Points

$\mathbf{A_y = 1110.05\ lb = 1.11\ k}$ **Ans** - 1 Point

$\overset{+}{\rightarrow} \Sigma F_X = 0$; $\mathbf{B_x = 0}$ **Ans** - 2 Points

$+\uparrow \Sigma F_y = 0$; $200 + 200 + 1000 + 300 - 1110.05 - B_y = 0$ - 2 Points

$\mathbf{B_y = 589.95\ lb = 590\ lb}$ **Ans** - 1 Point