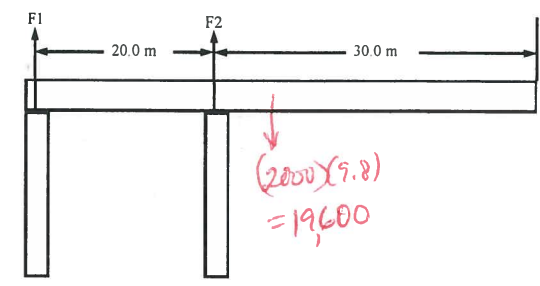
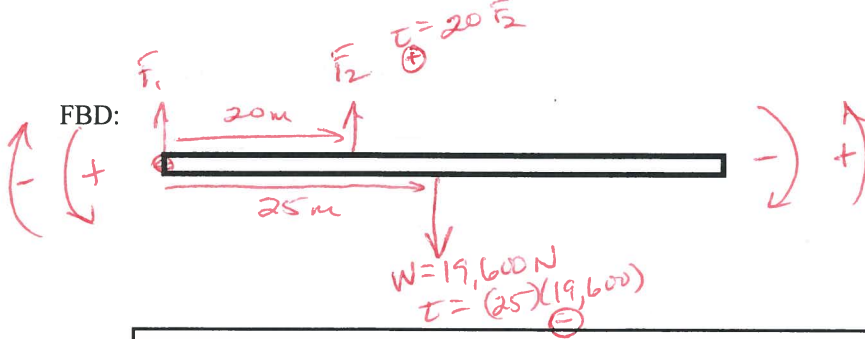


1. In the following cantilever, what are the values for F1 and F2? The beam has a uniform mass of 2000 kg.



$\Sigma F_y:$   $F_1 + F_2 - W = 0$

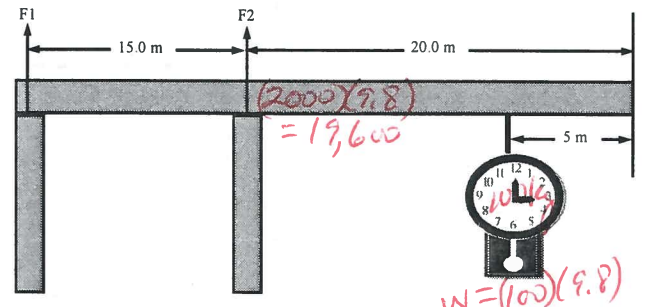
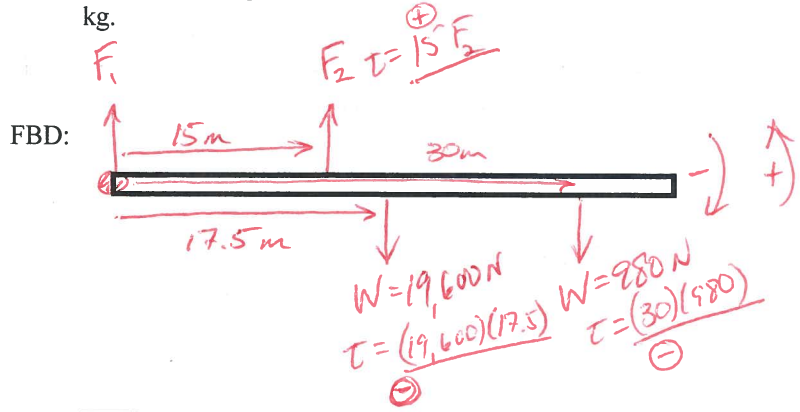
$F_1 = 19,600 - 24,500$

$F_1 = -4900 \text{ N}$   
 $F_2 = 24,500 \text{ N}$

$\Sigma \tau:$   $20 F_2 - 25(19,600) = 0$

$F_2 = \frac{4.9 \times 10^5}{20} = 24,500 \text{ N}$

2. In the following cantilever, what are the values for F1 and F2? The beam has a mass of 2000 kg. The clock has a mass of 100 kg.



$\Sigma F_y:$   $F_1 + F_2 - 19,600 - 980 = 0$

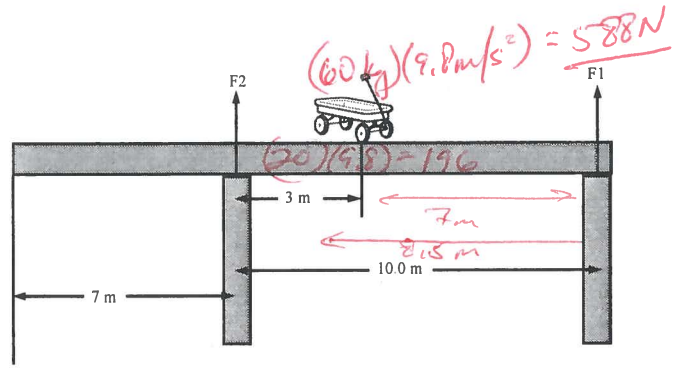
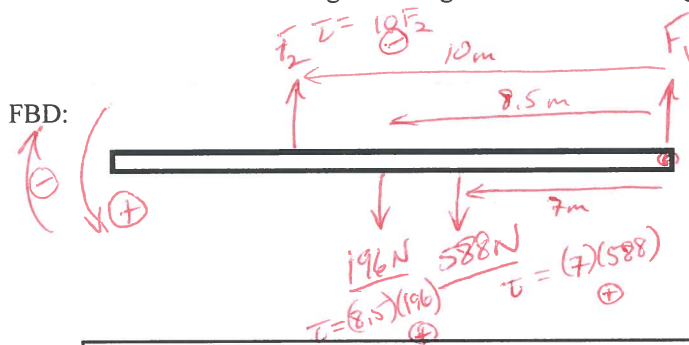
$F_1 = 19,600 + 980 - 24,827 = -4246.6 \text{ N}$

$F_1 = -4247 \text{ N}$   
 $F_2 = 24827 \text{ N}$

$\Sigma \tau:$   $15 F_2 - (19,600)(17.5) - (30)(980) = 0$

$F_2 = \frac{343000 + 29400}{15} = 24826.6 \text{ N}$

3. The beam has a mass of 20 kg. The wagon has a mass of 60 kg.



$$\Sigma F_y: F_1 + F_2 - 196 - 588 = 0$$

$$F_1 + 578.2 - 196 - 588 = 0$$

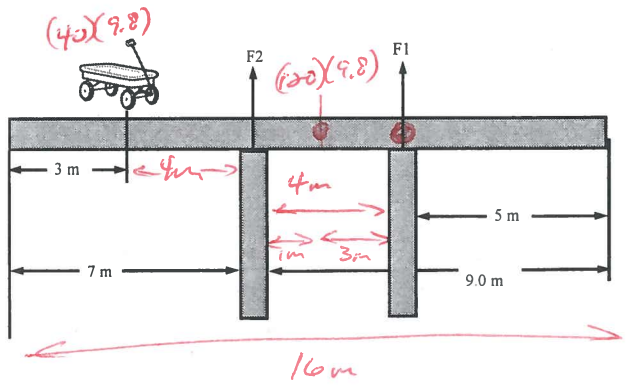
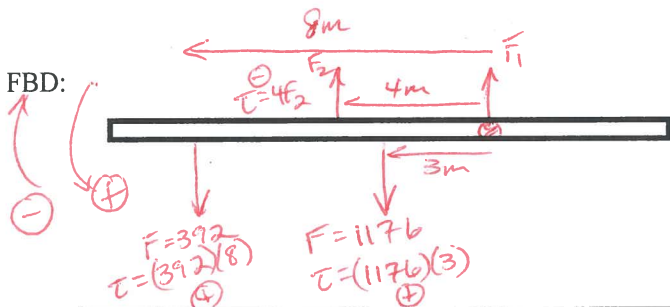
$$F_1 = 205.8 \text{ N}$$

$$\Sigma \tau: 7(588) + (8.5)(196) - 10F_2 = 0$$

$$F_2 = \frac{7(588) + 8.5(196)}{10}$$

$$F_2 = 578.2 \text{ N}$$

4. The beam has a mass of 120 kg. The wagon has a mass of 40 kg.



$$\Sigma F_y: F_1 + F_2 - 392 - 1176 = 0$$

$$F_1 = 392 + 1176 - 1666$$

$$F_1 = -98 \text{ N}$$

$$F_1 = -98 \text{ N}$$

$$\Sigma \tau: (392)(8) + (1176)(3) - 4F_2 = 0$$

$$F_2 = \frac{(392)(8) + (1176)(3)}{4}$$

$$F_2 = 1666 \text{ N}$$

$$F_2 = 1666 \text{ N}$$