



MAK104 STATICS
2017-2018 SUMMER
21.05.2018
QUIZ 2 - SOLUTION

Name Surname:

Number:

TOTAL TIME: 20 Minutes

GOOD LUCK

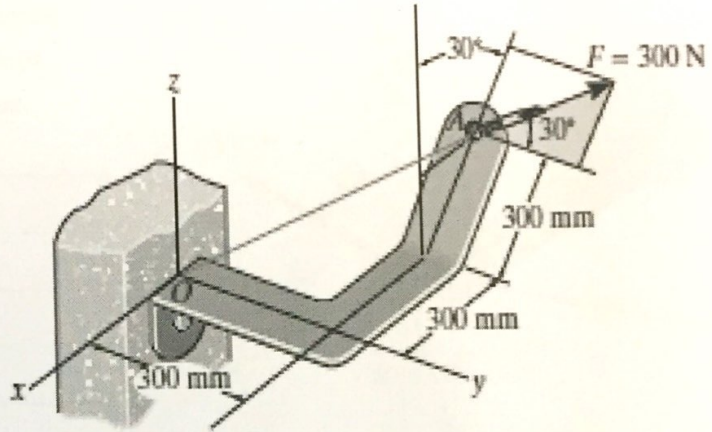
QUESTION: Determine the magnitudes of the projected components of the force

$$F = 300N$$

a) acting along the x and y axes

b) acting along line OA .

write the results in the given box below.



a) x ve y eksenleri boyunca etki

eden $F = 300N$ kuvvetinin birleşenlerinin büyüklüklerini belirleyiniz.

b) OA çizgisi boyunca hareket eden $F = 300N$ kuvvetinin birleşenlerinin büyüklüklerini belirleyiniz.

Bulduğunuz sonuçları aşağıdaki kutulara yazınız.

a)

F_x	-75 N
F_y	260 N
F_z	130 N

$$F = -300 \cdot \sin 30^\circ \cdot \sin 30^\circ i + 300 \cdot \cos 30^\circ j + 300 \sin 30^\circ \cos 30^\circ k$$

$$F = [-75i + 259.8j + 129.9k] N$$

$$F_x = F \cdot i = (-75i + 259.8j + 129.9k) \cdot i$$

$$F_x = 75N$$

$$F_y = F \cdot j = 259.8 \approx 260N$$

$$F_z = F \cdot k = 129.9 \approx 130N$$

b)

\vec{r}_{OA}	$-0.45i + 0.30j + 0.25k$
\vec{u}_{OA}	$-0.75i + 0.5j + 0.43k$
F_{OA}	242 N

$$b) F = [-75i + 259.8j + 129.9k] N$$

$$A(-0.45, 0.30, 0.25) \quad O(0, 0, 0)$$

$$\vec{r}_{OA} = (-0.45i + 0.30j + 0.25k)$$

$$\vec{u}_{OA} = \frac{(-0.45i + 0.30j + 0.25k)}{\sqrt{(-0.45)^2 + (0.30)^2 + (0.25)^2}}$$

$$\vec{u}_{OA} = -0.75i + 0.5j + 0.43k$$

$$F_{OA} = F \cdot u_{OA} = (-75i + 259.8j + 129.9k) \cdot (-0.75i + 0.5j + 0.43k)$$

$$= (-75) \cdot (-0.75) + (259.8) \cdot (0.5) + (129.9) \cdot (0.43)$$

$$F_{OA} = 242N$$