Rotational Motion Review Problems

AP 1

For problems 1-3, Find T1 and the vertical and horizontal forces on the bar in the corresponding picture. The bar has a weight of 150N in every picture.

1.

T1

15°

2.

T1

25°

17kg

T1

17°

3.

1/3L

10kg

7kg

In problems 4-6, determine where to add a 2kg mass to balance the scale.

4.

0cm

10cm

20cm

30cm

40cm

10cm

20cm

30cm

40cm

6kg

1kg

5.

0cm

10cm

20cm

30cm

40cm

10cm

20cm

30cm

40cm

6kg

2kg

0cm

10cm

20cm

30cm

40cm

10cm

20cm

30cm

40cm

4kg

2kg

6.

In problems 7-9, find the missing variables. The figure is at rest. The bar always has a weight of 150N

7.

T1

17°

T2



1/4L

17°

65kg

8.

T1

17°

T2=450N



1/3L

9.   


m

T1

30°

T2



1/3L

65kg 70kg

1/4L

V of (each) mass  
ω of pulley  
a of (each) mass  
α of the pulley

For problems 10-12, find the following:

10. Find the required values after two rotations of the pulley

.3m

16kg

2kg

11. Find the required values after the heavier mass has fallen 0.5m

.25m

6kg

6kg

2kg

12. Find the required values just before the heavier mass hits the floor.

0.75m

4kg

6kg

.25m

8kg

For questions 13-15, find the missing values. Assume the ball rolls without slipping. The radius is 0.07m

m=0.2kg

Vi=0

13.

Vf­=?

ωf=?

0.75m

m=0.125kg

Vi=?

0.5m

Vf­=0

h=2m

14.

m=0.5kg

Vi=2m/s

0.65m

Vf­=0

h=?

15.