Exercises

1. Problem of tire beads.

   Explain what would be the possible problem for a tire that has tight or loose beads.

2. Tire size codes.

   Explain the meaning of the following tire size codes:

   (a)
   $$10.00R20\ 14(G)$$

   (b)
   $$18.4R46$$

   (c)
   $$480/80R46155A8$$

   (d)
   $$18.4 - 38(10)$$

   (e)
   $$76 \times 50.00B32 = 1250/45B32$$

   (f)
   $$LT255/85B16$$

   (g)
   $$33x12.50R15LT$$

3. Tire height and diameter.

   Find the tire height h_T and diameter D for the following tires.

   (a)
   $$480/80R46\ 155A8$$

   (b)
   $$P215/65R15\ 96H$$

4. ★ Plus one.

   Increase 1 in to the diameter of the rim of the following tires and find a proper tire for the new rim.

   $$P215/65R15\ 96H$$
   $$P215/60R15\ 96H$$

5. Tire of Porsche 911 turbo^{TM}.

   A model of Porsche 911 turbo^{TM} uses the following tires.

$$front \quad 235/35ZR19$$
$$rear \quad 305/30ZR19$$

   Determine and compare h_T, and D for the front and rear tires.

6. Tire of Porsche Cayenne turbo^{TM}.

   A model of Porsche Cayenne turbo^{TM} is an all-wheel-drive that uses the following tire.
$$255/55R18$$

   What is the angular velocity of its tires when it is moving at the top speed $v = 171 \, \text{mi}/\, \text{h} \approx 275 \, \text{km}/\, \text{h}$?

7. Tire of Ferrari P 4/5 by Pininfarina^{TM}.

   A model of Ferrari P 4/5 by Pininfarina^{TM} is a rear-wheel-drive sport car that uses the following tires.

$$front \quad 255/35ZR20$$
$$rear \quad 335/30ZR20$$

   What is the angular velocity of its tires when it is moving at the top speed $v = 225 \, \text{mi}/\, \text{h} \approx 362 \, \text{km}/\, \text{h}$?

8. Tire of Mercedes-Benz SLR 722 Edition^{TM}.

   A model of Mercedes-Benz SLR 722 Edition^{TM} uses the following tires.
$$front \quad 255/35R19$$
$$rear \quad 295/30R19$$

   What is the speed of this car if its rear tires are turning at

$$\omega = 2000 \; rmp.$$

   At that speed, what would be the angular velocity of the front tires?

9. Tire of Chevrolet Corvette $Z06^{TM}$.

   A model of Chevrolet Corvette $Z06^{TM}$ uses the following tires.

$$front \quad 275/35ZR18$$
$$rear \quad 325/30ZR19$$

   What is the speed of this car if its rear tires are turning at

$$\omega = 2000 \; rmp.$$

   At that speed, what would be the angular velocity of the front tires?

10. Tire of Koenigsegg CCX^{TM}.

    Koenigsegg CCX^{TM} is a sport car, equipped with the following tires.

    $$\begin{array}{ll} front & 255/35R19 \\ rear & 335/30R20 \end{array}$$

    What is the angular speed ratio of the rear tire to the front tire?