18) The moons of Mars, Phobos (Fear) and Deimos (Terror), are very close to the planet compared to Earth's Moon. Their orbital radii are 9,378 km and 23,459 km respectively. What is the ratio of the period of revolution of Phobos to that of Deimos?

A) 0.2528  B) 1.582  C) 3.956  D) 0.3998  E) 2.858

19) A plane has an airspeed of 142 m/s. A 16.0 m/s wind is blowing southward at the same time as the plane is flying. If the velocity of the plane relative to Earth is due east, what is the magnitude of that velocity?

A) 16.2 m/s  B) 141 m/s  C) 158 m/s  D) 16.0 m/s  E) 48 m/s

20) A tightrope walker with a mass of 60.0 kg stands at the center of a rope which was initially strung horizontally between two poles. His weight causes the rope to sag symmetrically, making an angle of 4.80° with the horizontal. What is the tension in the rope?

A) 359 N  B) 2470 N  C) 1760 N  D) 589 N  E) 3520 N

\[ T \sin \theta + T \sin \theta - mg = 0 \]
\[ 2T \sin \theta = mg \]
\[ T = \frac{mg}{2 \sin \theta} = \frac{(60)(9.81)}{2 \sin 4.8^\circ} = 3520 \text{ N} \]