Answer on Question #43326 – Physics - Mechanics | Kinematics | Dynamics

It takes 1506 lb of force to pull a 5800 lb truck out of the snow. What is the coefficient of static friction?

Solution

$F = 1506\ lb \cdot g - initial\ force;$
$m = 5800\ lb - mass\ of\ the\ truck;$
Second Newton's law along the X-axis:
$$F - F_{frict} = 0 \quad (1)$$
Second Newton's law along the Y-axis:
$$mg = N$$
Formula for the friction force ($k -$ coefficient of static friction):
$$F_{frict} = N \cdot k = mg \cdot k \quad (2)$$
$$(2)in(1):$$
$$F - mg \cdot k = 0$$
$$k = \frac{F}{mg} = \frac{1506\ lb \cdot g}{5800\ lb \cdot g} = \frac{1506}{5800} = 0.26$$
Answer: coefficient of static friction is equal to 0.26.