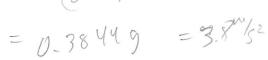37. Venus has a mass of about 0.0558 times the mass of Earth and a diameter of about 0.381 times the diameter of Earth. The acceleration of a body falling near the surface of Venus is about:
   A) 0.21 m/s²
   B) 1.4 m/s²
   C) 2.8 m/s²
   D) 3.8 m/s²
   E) 25 m/s²

$$a = G\frac{M}{r^2} \quad \Rightarrow \quad G\frac{0.0558M}{(0.381)^2 r^2}$$

$$= 0.3844\,g = 3.8\,m/s^2$$

38. In simple harmonic motion, the magnitude of the acceleration is:
   A) constant
   B) proportional to the displacement
   C) inversely proportional to the displacement
   D) greatest when the velocity is greatest
   E) never greater than g

39. A man pushes an 80-N crate a distance of 5.0 m upward along a frictionless slope that makes an angle of 30° with the horizontal. His force is parallel to the slope. If the speed of the crate decreases at a rate of 1.5 m/s², then the work done by the man is:
   A) −200 J
   B) 61 J
   C) 140 J
   D) 200 J
   E) 260 J

$$W = \Delta KE$$

$$F = ma$$

$$w = F \cdot d$$

$$F = \frac{80 \cdot 1.5}{g}$$

$$\frac{80 \cdot 1.5}{g}$$

40. A certain spring elongates 9 mm when it is suspended vertically and a block of mass M is hung on it. The natural frequency of this mass-spring system is:
   A) is 0.088 rad/s
   B) is 33 rad/s
   C) is 200 rad/s
   D) is 1140 rad/s
   E) cannot be computed unless the value of M is given

$$W = 2\pi f$$

$$\sqrt{\frac{k}{M}} : 2\pi f$$

41. In the formula $F = Gm_1m_2/r^2$, the quantity G:
   A) depends on the local value of g
   B) is used only when the Earth is one of the two masses
   C) is greatest at the surface of the Earth
   D) is a universal constant of nature
   E) is related to the Sun in the same way that g is related to the Earth