

4.1.1 A horse has a kinetic energy of 10,000 slug (furlongs/fortnight)², what is its kinetic energy in MKS units?

$$1 \text{ slug} = 1 (\text{furlong/fortnight})^2$$

$$1 \text{ furlong} = \frac{1}{8} \text{ mile}$$

$$= \frac{1}{8} \times 1600 \text{ m}$$

$$= 200 \text{ m}$$

$$1 \text{ fortnight} = 14 \text{ days}$$

$$= 14 \times 24 \text{ hours}$$

$$= 14 \times 24 \times 60 \text{ min}$$

$$= 14 \times 24 \times 60 \times 60 \text{ s}$$

$$1 \text{ slug} = \left[\frac{200 \text{ m}}{14 \times 24 \times 60 \times 60 \text{ s}} \right]^2$$

$$= \left[\frac{1}{6048} \right]^2 \text{ m}^2 \text{ s}^{-2}$$

$$\text{Kinetic Energy of a Horse} = 10,000 \text{ slug}$$

$$= 10,000 \times \left[\frac{1}{6048} \right]^2 \text{ m}^2 \text{ s}^{-2}$$

$$= \boxed{2.734 \text{ m}^2 \text{ s}^{-2}}$$