

ANSWER KEY

Kinetic Energy Practice Problems

1. What is the Kinetic Energy of a 150 kg object that is moving with a speed of 15 m/s?

$$KE = \frac{1}{2} mv^2$$

$$KE = ?$$

$$m = 150\text{kg}$$

$$v = 15\text{m/s}$$

$$KE = \frac{1}{2} (150\text{kg}) (15 \text{ m/s})^2$$

$$KE = \frac{1}{2} (150\text{kg}) (225)$$

$$KE = 16875\text{J}$$

2. An object has a kinetic energy of 25 J and a mass of 34 kg , how fast is the object moving?

$$KE = \frac{1}{2} mv^2$$

$$KE = 25\text{J}$$

$$m = 34\text{kg}$$

$$v = ?$$

$$2KE/m = v^2 \text{ OR } v^2 = 2KE/m$$

$$v^2 = 2(25\text{J})/34\text{kg}$$

$$\sqrt{v^2} = \sqrt{1.47}$$

$$v = 1.28\text{m/s}$$

3. An object moving with a speed of 35 m/s and has a kinetic energy of 1500 J, what is the mass of the object.

$$KE = \frac{1}{2} mv^2$$

$$KE = 1500\text{J}$$

$$m = ?$$

$$v = 35\text{m/s}$$

$$2KE/v^2 = m \text{ OR } m = 2KE/v^2 \text{ (rearrange equation)}$$

$$m = 2(1500\text{J})/(35)^2$$

$$m = 3,000/1225$$

$$m = 2.45\text{kg}$$

4. What is the Kinetic Energy of a 1200 kg object that is moving with a speed of 24 m/s?

$$KE = \frac{1}{2} mv^2$$

$$KE = ?$$

$$m = 1200\text{kg}$$

$$v = 24\text{m/s}$$

$$KE = \frac{1}{2} (1200\text{kg}) (24 \text{ m/s})^2$$

$$KE = \frac{1}{2} (1200\text{kg}) (576)$$

$$KE = 345,600\text{J}$$

5. An object has a kinetic energy of 14 J and a mass of 17 kg , how fast is the object moving?

$$KE = \frac{1}{2} mv^2$$

$$KE = 14\text{J}$$

$$m = 17\text{kg}$$

$$v = ?$$

$$2KE/m = v^2 \text{ OR } v^2 = 2KE/m$$

$$v^2 = 2(14\text{J})/17\text{kg}$$

$$\sqrt{v^2} = \sqrt{1.65}$$

$$v = 1.28\text{m/s}$$

6. An object moving with a speed of 67 m/s and has a kinetic energy of 500 J, what is the mass of the object.

$$KE = \frac{1}{2} mv^2$$

$$KE = 500J$$

$$m = ?$$

$$v = 67m/s$$

$$2KE/v^2 = m \quad \text{OR} \quad m = 2KE/v^2 \quad (\text{rearrange equation})$$

$$m = 2(500J)/(67)^2$$

$$m = 1000J/4,489$$

$$m = .22 \text{ kg}$$

7. What is the Kinetic Energy of a 478 kg object that is moving with a speed of 15 m/s?

$$KE = \frac{1}{2} mv^2$$

$$KE = ?$$

$$m = 478kg$$

$$v = 15m/s$$

$$KE = \frac{1}{2} (478kg) (15 \text{ m/s})^2$$

$$KE = \frac{1}{2} (478kg)(225)$$

$$KE = 53,775J$$

8. An object has a kinetic energy of 88 J and a mass of 45 kg , how fast is the object moving?

$$KE = \frac{1}{2} mv^2$$

$$KE = 88J$$

$$m = 45kg$$

$$v = ?$$

$$2KE/m = v^2 \quad \text{OR} \quad v^2 = 2KE/m$$

$$v^2 = 2(88J)/45kg$$

$$\sqrt{v^2} = \sqrt{3.91}$$

$$v = 1.98m/s$$

9. An object moving with a speed of 21 m/s and has a kinetic energy of 140 J, what is the mass of the object.

$$KE = \frac{1}{2} mv^2$$

$$KE = 140J$$

$$m = ?$$

$$v = 21m/s$$

$$2KE/v^2 = m \quad \text{OR} \quad m = 2KE/v^2 \quad (\text{rearrange equation})$$

$$m = 2(140J)/(21)^2$$

$$m = 280J/441$$

$$m = 0.63kg$$

10. What is the Kinetic Energy of a 100 kg object that is moving with a speed of 12.5 m/s?

$$KE = \frac{1}{2} mv^2$$

$$KE = ?$$

$$m = 100kg$$

$$v = 12.5m/s$$

$$KE = \frac{1}{2} (100kg) (12.5 \text{ m/s})^2$$

$$KE = \frac{1}{2} (100kg)(156.25)$$

$$KE = 7,812.5J$$