1. The coefficient of friction is 0.4 and the normal reaction is 100 N. What is the maximum (limiting) friction force, in N?

   _____

2. A car starts from rest and accelerates at 2.5 m/s² for 4 s. Using v = u + at, what is its speed (m/s)?

   _____

3. A 2 kg body moving at 3 m/s hits a stationary 1 kg body and they stick together. What is their common speed (m/s)?

   _____

4. A resultant force gives a 5 kg mass an acceleration of 2 m/s². What is the force (F = ma), in N?

   _____

5. What is the kinetic energy of a 2 kg object moving at 3 m/s (KE = ½mv²), in J?

   _____

6. A particle is in equilibrium when the forces on it:

   ☐ are all equal in size

   ☐ are all pointing up

   ☐ are all friction

   ☐ have a vector sum of zero

7. On a velocity–time graph, the area under the line gives the:

   ☐ acceleration

   ☐ force

   ☐ displacement

   ☐ mass

8. Momentum is defined as:

   ☐ mass × velocity

   ☐ force × distance

   ☐ mass × acceleration

   ☐ mass / velocity

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   ☐ only use horizontal components

   ☐ ignore gravity

   ☐ resolve the forces along and perpendicular to the slope

   ☐ assume no acceleration

10. Doubling the speed of an object doubles its kinetic energy.

    ☐ True ☐ False

1. **40**

   Maximum friction = μR = 0.4 × 100 = 40 N.

2. **10**

   v = 0 + 2.5 × 4 = 10 m/s.

3. **2**

   2(3) + 1(0) = (2+1)v, so 6 = 3v, giving v = 2 m/s.

4. **10**

   F = ma = 5 × 2 = 10 N.

5. **9**

   KE = ½ × 2 × 3^2 = ½ × 2 × 9 = 9 J.

6. **have a vector sum of zero**

   Equilibrium means the forces balance – their vector sum is zero.

7. **displacement**

   Area = displacement; the gradient gives the acceleration.

8. **mass × velocity**

   Momentum = mass × velocity, a vector quantity.

9. **resolve the forces along and perpendicular to the slope**

   Resolve along the slope (apply F = ma there) and perpendicular to it (for the normal reaction).

10. **False**

    KE = ½mv^2, so doubling v quadruples KE (2^2 = 4 times).

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