Acceleration

1. State the definition for acceleration and the SI unit for acceleration.

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2. State the three different ways an objects velocity may change.

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3. State the equation used to calculate acceleration, with the units for each quantity.

4. Calculate the acceleration of the following objects:

    a. A car that goes from 0 to 30 m/s in 5 seconds

    b. A runner that goes from 4m/s to 8 m/s in 10 seconds

    c. A car travelling at 10 m/s that comes to a stop at traffic lights in 3 seconds

    d. A dog walking at 3 m/s suddenly spotting a squirrel and starts chasing it at 12 m/s in 1.5 seconds

    e. A train travelling at 50 m/s slows down to stop in 1 minute

5. Explain what it means for an object to have a negative acceleration.

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6. Calculate the final velocity of:

    a. A train that accelerates from rest at 10 m/s^2 for 8 seconds.

    b. An eagle that accelerates from 6 m/s at 2 m/s^2 for 5 seconds.

7. Calculate the initial velocity of:

    a. an object that accelerates at 4 m/s^2 for 5 seconds and reaches a final velocity of 100 m/s.

    b. an aeroplane that accelerates at 50 m/s^2 for 10 seconds and reaches a new velocity of 1000 m/s.

8. Calculate how long it takes for:

    a. A jet to reach 600 m/s if it started from rest and accelerated at 30 m/s^2.

    b. A dog to reach 15 m/s from 5 m/s, accelerating at 2 m/s^2.