**Calculating Acceleration**

Acceleration is defined as

This gives us the formula of

If we remember that change in velocity is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, then we can use this formula to solve for the changing motion in many different situations.

**Example 1:** A motorcycle is travelling at 13m/s East when it slows down for 10s to a velocity of 4m/s east. What was the acceleration of the motorcycle?

**Example 2:** A soccer ball, rolling at 1.52m/s South is kicked and has a velocity of 4.33m/s North. If the kick imparted an acceleration of 56m/s2 North, how long was the foot in contact with the ball?

**Example 3:** A car is accelerated -3m/s2 for 12 seconds. How fast was the car going if it ended up travelling at 13km/h?

**Acceleration due to Gravity**

The most common example of acceleration is gravity. Gravity is always accelerating objects towards \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Galileo proposed that gravity accelerates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the same amount and if thing fall at a different rate, the difference is due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. We have been able to verify his statements by dropping a hammer and a feather on the moon and observing they fell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Since the direction of gravity is down, we usually state the acceleration is in the \_\_\_\_\_\_\_ direction. Acceleration due to gravity is given the symbol *\_\_\_\_* and is *\_\_\_\_\_\_\_\_\_\_\_*.