

**Rates of Change (3.4)**

Average Rate of Change	Instantaneous Rate of Change

**Find the rate of change.**

1. The volume of a cube with respect to the base side.
2. The surface area of a cube with respect to the base side when the base side is 8ft.

**Find the instantaneous velocity.**

3.  $s(t) = t^3 - 3t^2 - 24t + 10$ ,  $t = 0, 5$

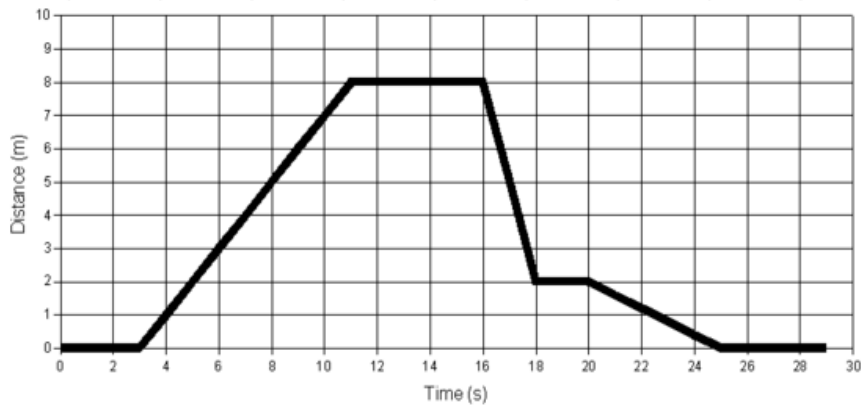
**Find where the object stops moving.**

4.  $s(t) = t^3 - 3t^2 - 24t + 10$

**A bullet is fired in the air vertically from with an initial velocity of 200 m/s and an initial height of 30 m.**

5. Find the velocity at  $t = 3$  and  $t = 8$ .
6. What is the bullet's maximum height and when does it reach its maximum height?

The function represents the distance,  $s(t)$ , an object is away from the origin at time  $t$ .



7. Find the velocity at  $t = 6, 14,$  and  $22$ .

8. Where is the object at its fastest?

9. What is the meaning of  $s'(17)$ ?

10. What is the meaning of  $s(28)$ ?