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A particle moves along a number line according to $(t),$ $t\geq 0$, where $t$ is measured in seconds and $f$ is measured in feet.

1. Find the velocity at time t.
2. What is the velocity after 3 seconds?
3. When is the particle at rest?
4. When is the particle moving to the right?
5. Find the total distance traveled during the first 8 seconds.
6. When is the particle speeding up?
7. Draw a number line diagram to illustrate the motion of the particle.
8. $f\left(t\right)=t^{2}-10t+12$ 2. $f\left(t\right)=t^{3}-9t^{2}+15t+10$

3. $f\left(t\right)=t^{3}-12t^{2}+36t$ 4. $f\left(t\right)=t^{4}-4t+1$

5. $f\left(t\right)=\frac{t}{t^{2}+1}$ 6. $f\left(t\right)=3t^{5/2}-35t^{\frac{3}{2}}+90t^{1/2}$

8. If a ball is given a push so that it has an initial velocity of 5 m/s down a certain inclined plane, then the distance it has rolled after t seconds is $s=5t+3t^{2}$.

a. Find the velocity after 2 seconds. b. How long does it take for the velocity to reach 35 m/s?

10. If a ball is thrown vertically upward with a velocity of 80 ft/s, then its height after t seconds is $s=80t-16t^{2}$.

a. What is the maximum height reached by the ball?

b. What is the velocity of the ball when it has risen 96ft above the ground?