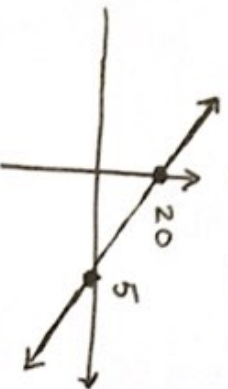


1. (a) $v(t) = \frac{d}{dt}(-2t^2 + 20t)$
 $= -4t + 20$



(b) The object slows down as it moves higher in the air. At its highest point it will come to a stop before starting to fall back down. The velocity at the highest point will be zero:

$$-4t + 20 = 0$$

$$t = 5$$

The highest point is reached after 5 seconds.

(c) $s(5) = -2(5)^2 + 20(5)$
 $= 50$ feet

(d) The position is zero when the ball strikes the ground.

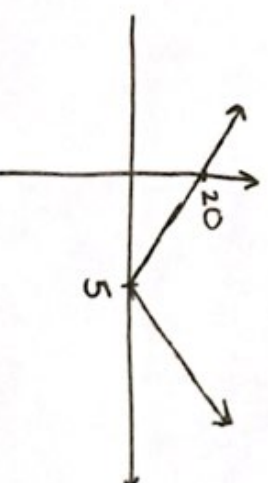
$$-2t^2 + 20t = 0$$

$$t = 0 \text{ and } t = 10$$

Time when it was thrown up

(e) $v(10) = -4(10) + 20$
 $= -20$ ft/s

(f) Since speed = |velocity|, the graph of the speed is given by



Time the ball strikes the ground

Speed is increasing on $(5, 10]$

$$\begin{aligned}
 2. \quad & \frac{d}{dx} \left(-\frac{2}{(x^3+9)^7} \right) \\
 &= \frac{d}{dx} \left(2 (x^3+9)^{-7} \right) \\
 &= 2 \cdot -7 (x^3+9)^{-8} \cdot (3x^2+0) \\
 &= -42 x^2 (x^3+9)^{-8}
 \end{aligned}$$