

Linear Motion Practice (Pt.1)

Date _____ Period _____

A particle moves along a horizontal line. Its position function is $s(t)$ for $t \geq 0$. For each problem, find the velocity function $v(t)$ and the acceleration function $a(t)$.

1) $s(t) = t^2 - 10t + 16$

2) $s(t) = -t^4 + 8t^3$

3) $s(t) = -t^2 + 3t + 88$

4) $s(t) = t^3 - 18t^2 + 81t$

5) $s(t) = t^2 - 24t + 135$

A particle moves along a horizontal line. Its position function is $s(t)$ for $t \geq 0$. For each problem, find the position, velocity, speed, and acceleration at the given value for t .

6) $s(t) = t^3 - 4t^2 - 60t$; at $t = 2$

7) $s(t) = t^4 - 11t^3$; at $t = 8$

8) $s(t) = -t^2 + 14t$; at $t = 7$

9) $s(t) = t^4 - 8t^3$; at $t = 8$

10) $s(t) = -t^3 + 11t^2 - 24t$; at $t = 3$

Answers to Linear Motion Practice (Pt.1) (ID: 1)

- 1) $v(t) = 2t - 10$, $a(t) = 2$
- 2) $v(t) = -4t^3 + 24t^2$, $a(t) = -12t^2 + 48t$
- 3) $v(t) = -2t + 3$, $a(t) = -2$
- 4) $v(t) = 3t^2 - 36t + 81$, $a(t) = 6t - 36$
- 5) $v(t) = 2t - 24$, $a(t) = 2$
- 6) $s(2) = -128$, $v(2) = -64$, speed at 2 = 64, $a(2) = 4$
- 7) $s(8) = -1536$, $v(8) = -64$, speed at 8 = 64, $a(8) = 240$
- 8) $s(7) = 49$, $v(7) = 0$, speed at 7 = 0, $a(7) = -2$
- 9) $s(8) = 0$, $v(8) = 512$, speed at 8 = 512, $a(8) = 384$
- 10) $s(3) = 0$, $v(3) = 15$, speed at 3 = 15, $a(3) = 4$