

Class work: Distance, Displacement, Speed

Date _____ Period _____

A particle moves along a horizontal line. Its position function is $s(t)$ for $t \geq 0$. For each problem, find the maximum speed and times t when this speed occurs, the displacement of the particle, and the distance traveled by the particle over the given interval.

1) $s(t) = t^2 - 12t - 13; 0 \leq t \leq 10$

2) $s(t) = t^3 - 4t^2 - 60t; 4 \leq t \leq 7$

$$3) s(t) = -t^3 + 12t^2; 2 \leq t \leq 14$$

$$4) s(t) = t^4 - 8t^3; 5 \leq t \leq 8$$

Answers to Class work: Distance, Displacement, Speed (ID: 1)

- 1) Maximum speed: 12 at $t = \{0\}$
Displacement: -20
Distance traveled: 52
- 2) Maximum speed: 44 at $t = \{4\}$
Displacement: -33
Distance traveled: 63
- 3) Maximum speed: 252 at $t = \{14\}$
Displacement: -432
Distance traveled: 864
- 4) Maximum speed: 512 at $t = \{8\}$
Displacement: 375
Distance traveled: 489