

Comparing Motions

1. Objects A and B shown for 10 seconds before the reference time:
 - a. B has a greater slope or speed at $t = -9$ s.
 - b. B has a greater slope or speed at $t = -3$ s.
 - c. Since the graphs do not cross, the objects are not at the same position at the same time.
 - d. When the graph approaches the horizontal axis, the object is returning toward the reference point again or moving “backward”.
 - e. The objects are closest together at about $t = -6$ s.
 - f. They are about 2 m apart at $t = -6$ s.

2. Graph 2 with objects A and B.
 - a. At $t = 0$ s, A is slowing down because the slope is slightly decreasing during the time just before and after $t = 0$ s.
 - b. At $t = 0$ s, B is speeding up because the slope is increasing a bit during the interval about $t = 0$ s.
 - c. When the two lines are parallel A and B have the same slope, which may be true between $t = 6$ and $t = 7$ s.
 - d. A turns around at $t = 7.5$ s.
 - e. B doesn't turn around; it always moves in a positive direction from the $x = -4$ m position to the $x = +4$ m position on the numbered reference line.