Graphing Student Motion Review Sheets
Homework/Class Work

Answer the following questions for the object moving as shown in Position–Time Graph 1.

- \(15\text{ m}\) (a) How far does the object travel between 5 and 10 s?
- \(10\text{ to } 25\text{ s}\) (b) During which time interval is the velocity zero?
- \(0\) (c) How far does the object travel between 10 and 25 s?
- \(25\text{ to } 35\text{ s}\) (d) During which time interval is the velocity negative?
- \(0\) (e) What is the position of the object at 35 s?
- \(\text{NO}\) (f) Is the object accelerating during any time period represented by the graph?

Answer the following questions for the object moving as shown in Position–Time Graph 2.

- \(0\) (a) What is the velocity between 6 and 8 s?
- \(5\text{ m/s}\) (b) What is the velocity at 5 s?
- \(3\text{ and } 4\text{ s}\) (c) Is the velocity greater between 0 and 2 s or between 3 and 4 s?
- \(0\text{ to } 4\text{ s}\) (d) During which time interval(s) did the object accelerate?
- \(10\text{ m}\) (e) What is the displacement between 4 and 6 s?
- \(\text{DRAW V-T graph}\) (f)
- \(\text{DRAW A-T graph}\) (g)
Kinematics: Motion in One Dimension

Answer the following questions for the object moving as shown in Velocity–Time Graph 3.

(a) During which time interval is the acceleration zero?
(b) Is the acceleration greater between 10 and 15 s or between 15 and 20 s?
(c) What is the displacement at the end of 15 s?
(d) What is the displacement between 10 and 15 s?
(e) What is the acceleration between 15 and 20 s?

Answer the following questions for the car moving as shown in Velocity–Time Graph 4.

(a) At what time was the car stopped?
(b) What was the greatest velocity the car reached?
(c) How fast was the car going at 0.3 h?
(d) At what time did the car have the greatest velocity?
(e) During which time intervals was the car accelerating?
(f) What is the car's acceleration at 0.5 h?
(g) What is the acceleration of the car at 0.9 h?
Graph #1

\[ V \text{ m/s} \]

\[
\begin{array}{|c|c|c|c|}
\hline
\text{time (s)} & 10 & 20 & 30 \\
\hline
V & & & \\
\hline
\end{array}
\]

\[ 0-10 \text{ sec} \quad \frac{\Delta V}{\Delta t} = 3 \text{ m/s} \]

\[ 25 \text{ to } 35 \text{ sec} \quad \frac{\Delta V}{\Delta t} = -3 \text{ m/s} \]

No acceleration.

Graph #2

\[ a \text{ m/s}^2 \]

\[
\begin{array}{|c|c|c|c|}
\hline
\text{time (sec)} & 2 & 4 & 6 & 8 \\
\hline
acceleration & & & & \\
\hline
\end{array}
\]

Note: I didn't calculate velocity because \( 0-4 \text{ sec} \) velocity is changing and is not constant or zero.
Graph #3

0-5 sec \( \frac{8-0}{5-0} = \frac{8}{5} = 1.6 \text{ m/s}^2 \)

5-10 sec \( \frac{4-8}{10-5} = \frac{-4}{5} = -0.8 \text{ m/s}^2 \)

10-15 sec \( \frac{4-4}{15-10} = \frac{0}{5} = 0 \text{ m/s}^2 \)

Graph #4

0-1.2 sec \( \frac{60-0}{2-0} = \frac{60}{2} = 30 \text{ m/s}^2 \)

1.2-3.2 sec \( \frac{60-60}{3-2} = \frac{0}{1} = 0 \text{ m/s}^2 \)

3.2-5.2 sec \( \frac{40-60}{5-3} = \frac{-20}{2} = -10 \text{ m/s}^2 \)