Constant Velocity: Translating between graphs

Position: the location of an object, how far away an object is from 0 (the reference point)

Velocity: speed (how fast something is moving) + direction.

To calculate velocity, $v=\frac{change in position}{change in time}=\frac{∆x}{∆t}=the slope of the position graph$

A positive velocity means the object is moving in the positive direction.

A negative velocity means the object is moving in the negative direction.

For each given graph, imagine and literally walk out the motion. Fill in each missing graph/map. Write a story for the scenario.

x (m)

8

6

4

2

1 2 3 4 5 6 t(s)

1 2 3 4 5 6 t(s)

v (m/s)

4

2

0

-2

-4

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1.

Description:

Start at 1m.

Move to the right at 2m/s for 3s until your each 7m. Stay at 7m for 3 seconds.

0 1 2 3 4 5 6 7 8

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2.

x (m)

8

6

4

2

1 2 3 4 5 6 t(s)

1 2 3 4 5 6 t(s)

v (m/s)

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0 1 2 3 4 5 6 7 8

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Description:

Start at 6m. Move to the left at 2m/s for 3 seconds until you reach 0m. Move to the right for 1m/s for 3 seconds. You will end up at 3m.

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x (m)

8

6

4

2

1 2 3 4 5 6 t(s)

1 2 3 4 5 6 t(s)

v (m/s)

4

2

0

-2

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3.

0 1 2 3 4 5 6 7 8

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Description:

Start at 1m. Move to the right at 2m/s for 3 seconds until you reach 7m. Stay at 7m for 3 seconds.

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4.

x (m)

8

6

4

2

1 2 3 4 5 6 t(s)

1 2 3 4 5 6 t(s)

v (m/s)

4

2

0

-2

-4

0 1 2 3 4 5 6 7 8

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Description:

Start a 0m (initial position not given). Move to the right at 2m/s for 4 seconds until you reach 8m. Stand still for 2 seconds.

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x (m)

8

6

4

2

1 2 3 4 5 6 t(s)

1 2 3 4 5 6 t(s)

v (m/s)

4

2

0

-2

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5.

0 1 2 3 4 5 6 7 8

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Description:

You forgot your HW on your desk! You run 8m to the right in 2 seconds and walk back to where you were in 4 seconds.

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6.

x (m)

8

6

4

2

1 2 3 4 5 6 t(s)

1 2 3 4 5 6 t(s)

v (m/s)

4

2

0

-2

-4

0 1 2 3 4 5 6 7 8

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Description:

Start at 4m. Walk to the left at 1m/s for 3 seconds until you reach 1m. Walk to the right at 2m/s for 3 seconds. You will end at 7m.

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x (m)

8

6

4

2

1 2 3 4 5 6 t(s)

1 2 3 4 5 6 t(s)

v (m/s)

4

2

0

-2

-4

7.

0 1 2 3 4 5 6 7 8

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Description:

Start at 4m. Move to the left 1m/s for 3 seconds until you reach 1m. Move to the right 2m/s for 2 seconds until you reach 5m. Stay at 5m for 1 second.

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