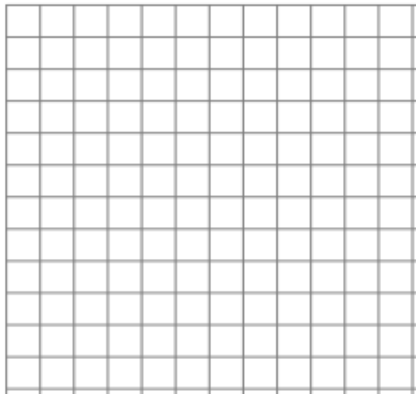
1-Dimensional Motion

Equations for 1D motion:

Problem set up steps:

Problems from notes:

Slide 5:
Draw a sketch of position vs time



Slide 6:
Calculate average v using equation

How does calculated v relate to graph?

Slides 7 & 8
Compare average velocity to instantaneous velocity

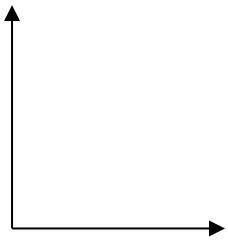
Slide 11
How far does the object travel from t = 2s to t = 6s?

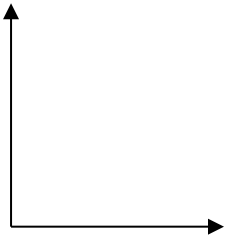
Slide 17

Type of *v*	**Sign of *a* needed to:**
+v	Speed up:
	Slow down:
-v	Speed up:
	Slow down:

Slide 18

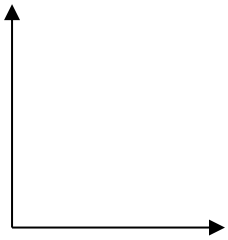
Draw a sketch of v vs t and x vs t for positive acceleration

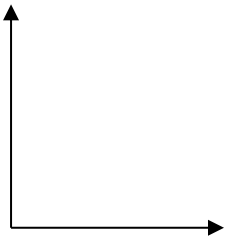




Slide 19

Draw a sketch of v vs t and x vs t for negative acceleration

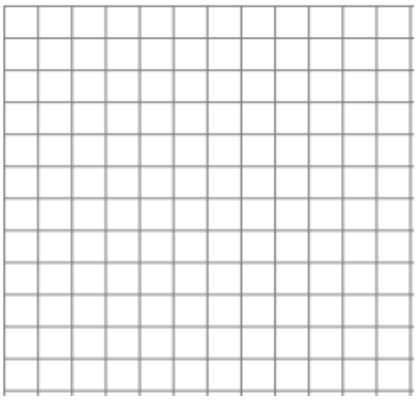




Slide 20:

A ball rolls up a slanted driveway. It starts at 2.50 m/s, slows down for 5.00 s, stops for an instant, then rolls back down at an increasing speed.

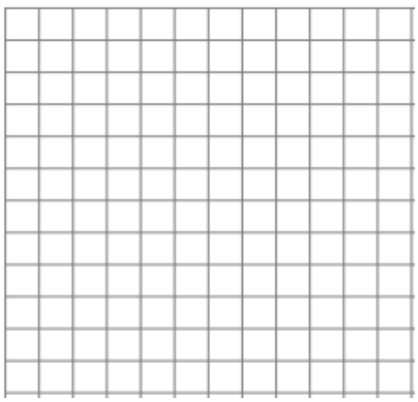
- What is the sign of the ball's velocity and acceleration as it rolls up the driveway? Down?
- What is the magnitude of the *a* as it rolls up the driveway? Down?
- Draw a sketch of this v vs t graph.



Slide 22 & 23

A car is traveling at 25 m/s and constantly decelerates for 50 seconds until it comes to a complete stop.

- Calculate the acceleration
- Draw a sketch of the v vs t graph
- How far has the car traveled during this time?



Slide 24
Determine both the acceleration and displacement of the moving object described in the graph.

Slide 28:
A jet lands on an aircraft carrier at 63 m/s. What is the acceleration if it stops in 2.0 s?

Slide 29:
A car initially traveling at 15.0 m/s accelerates at a rate of -2.00 m/s^2. If the car's final velocity is 10.0 m/s, how long was the period of acceleration?

Slide 30:
A car moves at 25 m/s and coasts up a hill with a uniform acceleration of -1.5 m/s^2.

- What is its displacement after 6.0 s?
- What is its displacement after 9.0 s?

Slide 31
A plane starting at rest at one end of a runway undergoes a uniform acceleration of 4.8 m/s^2 for 15 s before takeoff.

- What is its speed at takeoff?
- How long must the runway be for the plane to be able to take off?

Slide 32
A car starts at rest and speeds up with an acceleration of 3.5 m/s^2. How far will the car have gone when it is traveling at 25 m/s?

Slide 33
Alice is jogging at a velocity of 2.50 m/s. If she accelerates at a constant -0.10 m/s^2, how fast will he be jogging after 10.0 m?

Slide 34

A car is traveling at 25.0 m/s when the driver sees a dog in the road. It takes the driver 0.90 s to react, then steps on the brakes and slows at 6.5 m/s^2. How far does the car go before it stops?

Slide 35

A driver of a car traveling at 15.0 m/s applies the brakes, causing an acceleration of -2.0 m/s^2.

- How long does it take the car to accelerate to a final speed of 10.0 m/s?
- How far has the car moved during the breaking period?

Slide 36

A car starts from rest and travels for 5.0 s with a uniform acceleration of -1.5 m/s^2.

- What is the final velocity of the car?
- How far does the car travel during this period?

Slide 39

Jill hits a softball from a height of 0.80 m and gives it an initial velocity of +7.5 m/s straight up.

- How high will the ball go?
- How long will it take the ball to reach maximum height?

Slide 40

That crazy Bob doesn't look where he walks and topples right off the edge of the Grand Canyon.

- If the canyon is 1200 m tall, how long will he be falling?
- What will be his impact speed?

Slide 41

Penelope hits a volleyball so its initial velocity is 6.0 m/s. If the ball starts 2.0 m above the floor, how long will it be in the air before it strikes the floor?