



Brooklyn Tech

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Answer all question (17X 5.88) = 100.

1. Two stones, A & B, are thrown horizontally from the top of the Empire State Building by Sam and Edward. Sam exerted an initial speed of 15 m/s on stone A and Edward exerted an initial speed of 30 m/s on stone B. Compared to the time it takes stone A to reach the ground, the time it takes stone B to reach the ground is:

The same	Half as great	Twice as great	Four times as great
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2. Tim threw a penny horizontally at a speed of 30 m/s from the top of a Empire State Building to learn its height (Ignore air resistance). If the penny hits the ground 9 seconds later, find the **estimated** height of Empire State Building.

Show work	Write final answer

3. Edward, Tim's group member, standing on the roof of 50 meter high building kicks a stone a horizontal speed of 4 meter per second. How much time is required for the stone to reach the level ground below?

3.19 s	5.10 s	10.2 s	12.5 s
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4. Two stones, A & B, are thrown horizontally from the top of Empire State Building by Sam and Edward. Sam exerted initial speed 15 m/s on stone A and Edward exerted initial speed 30 m/s on stone B. Find the initial horizontal and vertical speed for stone A & B.

	Initial Horizontal Speed	Initial vertical Speed
Stone A		
Stone B		

5. Alwin kicks a ball with an initial velocity of 20 m/s at an angle of 60° with the horizontal and a total time of flight of 2.0 second. Find horizontal & vertical components of the ball's initial velocity. Also find the max height.

Show work	Write final answer

6.A Baseball player runs 27.4 meters from the batter's box to first base, overruns first base by 3 meters and then return to the first base. Compared to the total distance traveled by the player, the magnitude of the player's total displacement from the batter's box is :

3 m shorter	6 m shorter	3 m longer	6 m longer
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7. Mia jumped straight up to grab a rebound. If she was in the air for 1.2 seconds, how high did she jump?

Show work	Write final answer

8. Raymond fired a projectile with an initial velocity of 50 m/s at an unknown angle above the horizontal. If the projectile's initial vertical speed is 50 meters per second, then find the unknown angle.

Show work	Write final answer

9. An airplane flies with a velocity of 750 KPH, 30 degree south of east. What is the magnitude of the eastward component of plane velocity?

866 KPH	433 KPH	650 KPH	375 KPH
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10. How much time does it take light to travel from sun to earth?

Show work	Write final answer

11. A rock fall from the rest a vertical distance of 0.72 meter to the surface of a planet in 0.63 second. Find the magnitude of the acceleration due to gravity on that planet.

Show work	Write final answer

12. If Joan free falls for 2 seconds, what will be his final velocity and how far will he fall?

Show work	Write final answer

13. If Gianna's has a vertical leap of 1.40 m, then what is her takeoff speed and her hang time (total time to move upwards to the peak and then return to the ground)?

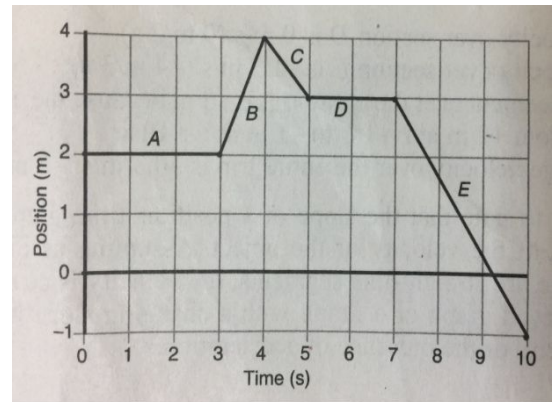
Show work	Write final answer

14. Artemiy's car is traveling at 22 m/s, and skids to a stop in 2.30 s. Determine the skidding distance of his car (assume uniform acceleration).

Show work	Write final answer

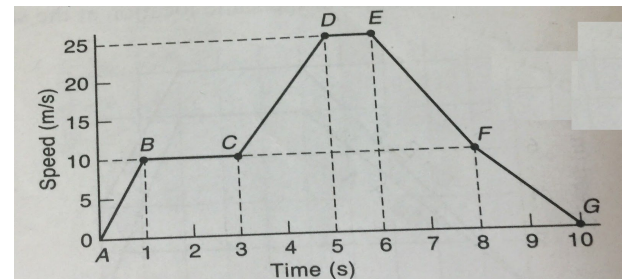
15. Use the graph on the right to answer the questions in the table:

Find displacement over entire trip	Find average velocity over entire trip



16. Use the graph on the right to answer the questions in the table:

Acceleration from 0 to 1 second.	Average speed from 1 to 3 second	Distance travel by object from 3 to 6 seconds.



17.

Extra credit: Mr. Bari went out on a 1.5 hour long bike trip and his $P(t) = \frac{40}{3} t^2$. After 20 miles, he saw a speed limit sign that read : 25 MPH. Draw a diagram, graph, two secant lines and the tangent line. What is the slope of the secant line? What is the slope of the tangent line? Did Mr. Bari break the law?

