

Topic 2.1 – Motion

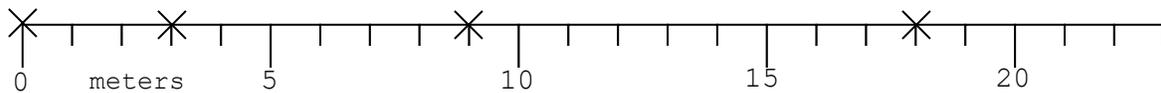
Formative Assessment

NAME: _____ TEAM: _____

THIS IS A PRACTICE ASSESSMENT. Show formulas, substitutions, answers (in spaces provided) and units!

1. A fly travels along the x-axis. His starting point is $x = -8.0$ m and his ending point is $x = -16$ m. His flight lasts 2.0 seconds. What is his velocity? 1. _____
2. A car traveling at 48 ms^{-1} is brought to a stop in 3.0 seconds. What is its acceleration? 2. _____
3. The acceleration of a car is -0.75 ms^{-2} . If its initial velocity is 12.0 ms^{-1} , what is its velocity 2.5 seconds later? 3. _____

At $t = 0.00 \text{ s}$ a fly is located at 0.0 m (marked with an \times). The fly is traveling in the positive x-direction. Every 0.50 seconds there is another \times marking the fly's position.



4. Complete the table:

4. See table

$t(\text{s})$	$x(\text{m})$	Δt	Δx	v

5. On the graph, plot the velocities vs. the times from your table.



5. See graph

6. Find the acceleration of the fly. 6. _____



Pinky and The Brain have developed a rocket that will accelerate at 16.0 ms^{-2} .

7. How fast will they be going 25.0 seconds after liftoff? 7. _____

8. How far will they have gone 25.0 seconds after liftoff? 8. _____



A bowling ball is launched upward with an initial speed of 25.0 ms^{-1} .

9. How long will it take to reach its maximum height? 9. _____

10. How far above its launch point will it go up? 10. _____

11. How long will it be in the air before returning to its launch point? 11. _____

A bowling ball is dropped from a balcony on the Tower of Pisa that is 18 m above the ground.

12. How long will it take to reach the ground? 12. _____

13. What will its speed be when it reaches the ground? 13. _____

A bowling ball is thrown downward at 22 ms^{-1} from a balcony on the Tower of Pisa that is 18 m above the ground.

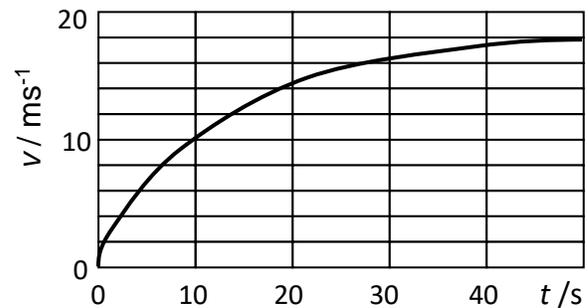
14. What will its speed be when it reaches the ground? 14. _____

15. How long will it take to reach the ground? 15. _____



A whale is in free-fall. Her speed vs. time is plotted in the graph.

16. Draw labeled free-body diagrams of the whale at the times $t = 0 \text{ s}$, $t = 10 \text{ s}$, and $t = 50 \text{ s}$.



17. What is her terminal speed? 17. _____

18. What is her instantaneous acceleration at $t = 20 \text{ s}$? 18. _____

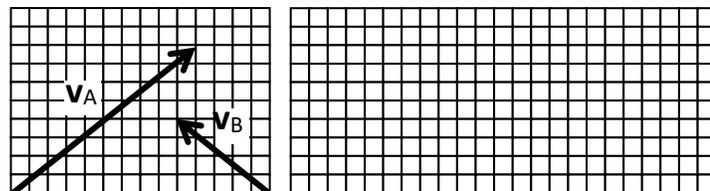
19. What does the area under a velocity vs. time graph tell you? 19. _____

20. What does the slope of a velocity vs. time graph tell you? 20. _____

21. What does the area under an acceleration vs. time graph tell you? 21. _____

Two cars A and B are driving at velocities represented below as scale arrows.

22. Sketch accurately the vector representing the velocity of A relative to B on the grid provided. Make it the same scale. 22. See graph



23. If the grid lines in the previous graph represent 2.0 ms^{-1} increments, find the magnitude of the vector you drew representing the velocity of A relative to B. Be very exact! 23. _____