

Equations of motion

$$v = a t + u$$

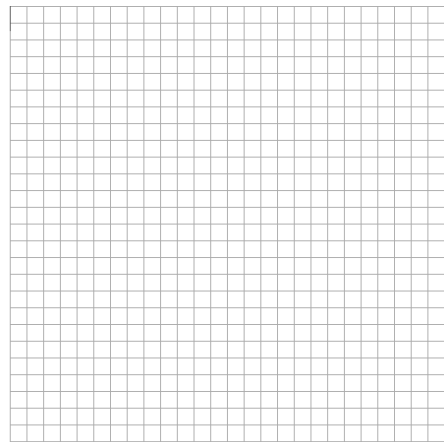
$$s = u t + \frac{1}{2} a t^2$$

$$v^2 = u^2 + 2 a s$$

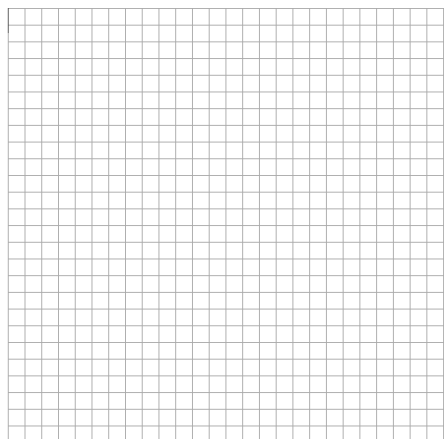
1. A tiger starts from **rest** and accelerates uniformly at **6 m/s²** for **270 m**. Calculate the time it takes to cover the distance.

2. A train moving at **20 m/s** brakes and decelerates uniformly at **8m/s²**. How much **distance** does it travel before coming to a stop?

3. A car travels at a **constant velocity of 20 m/s** for a duration of 10 seconds. Plot the velocity-time graph for this motion.

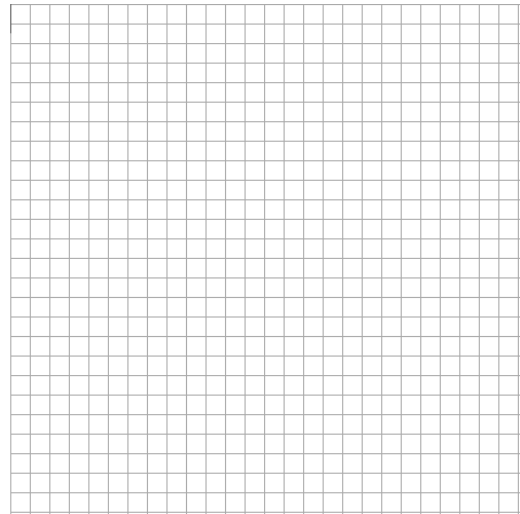


4. A car starts from rest and accelerates uniformly at a rate of 5 m/s² for a duration of 8 seconds. Plot the velocity-time graph for this motion.

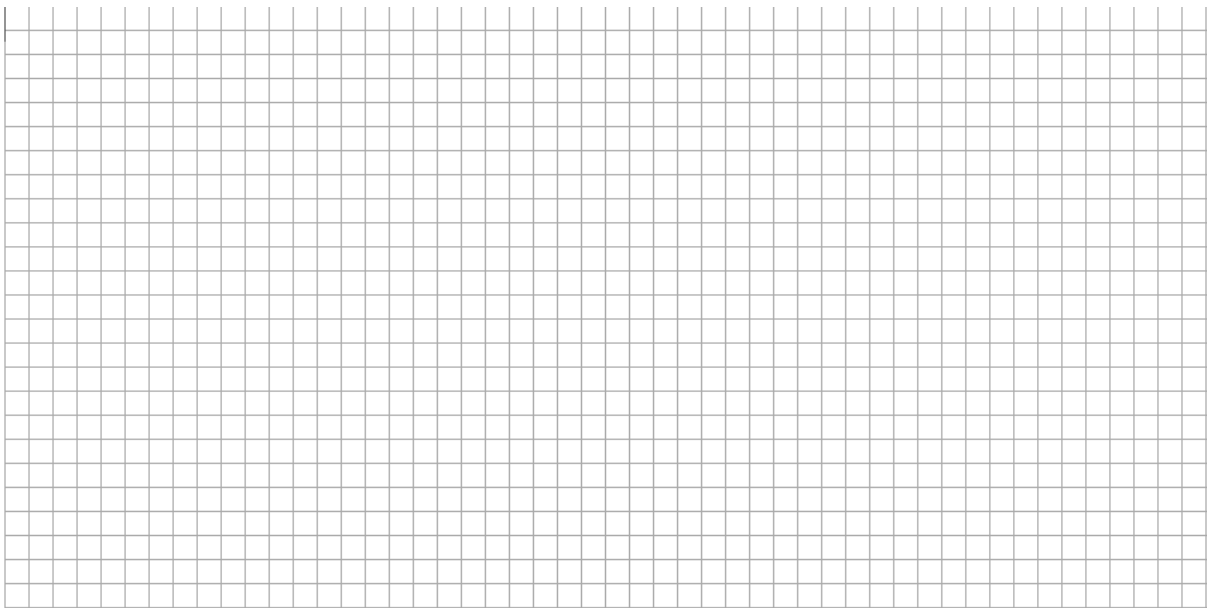


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5. A cyclist decelerates uniformly at a rate of 2 m/s^2 for **6 seconds** until coming to a **stop**. Plot the velocity-time graph for this motion.

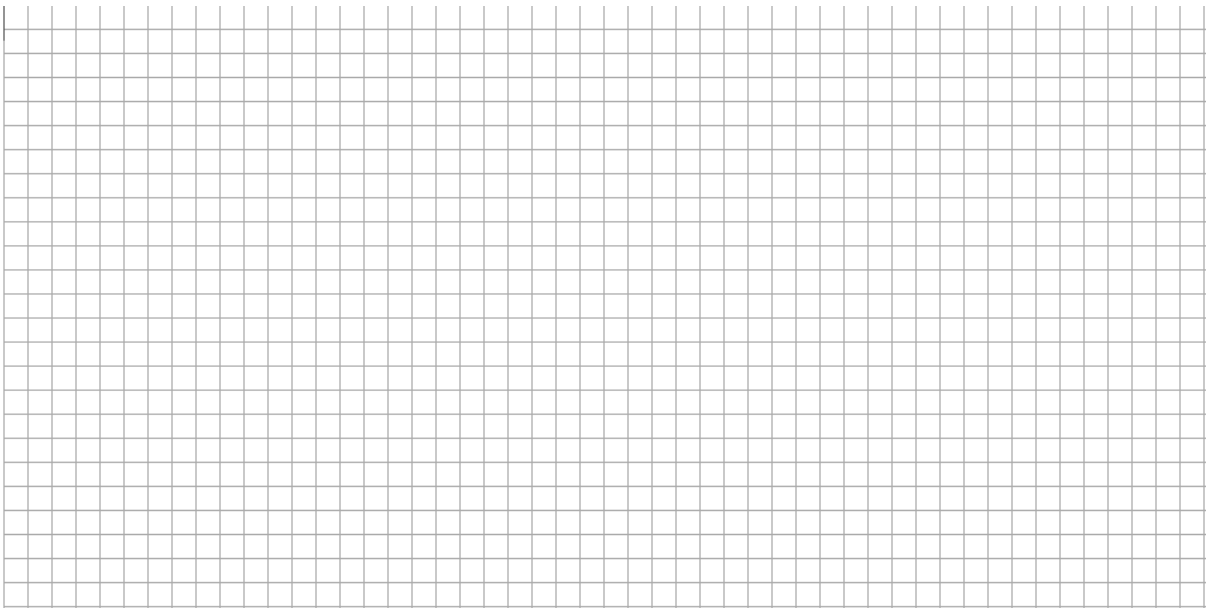


6. A train accelerates from the **rest** uniformly at a rate of 2 m/s^2 for the first **5 seconds**, then travels at a constant velocity for the next **10 seconds**, and finally decelerates uniformly at a rate of 2.5 m/s^2 until coming to a **stop**. Plot the velocity-time graph for this motion.

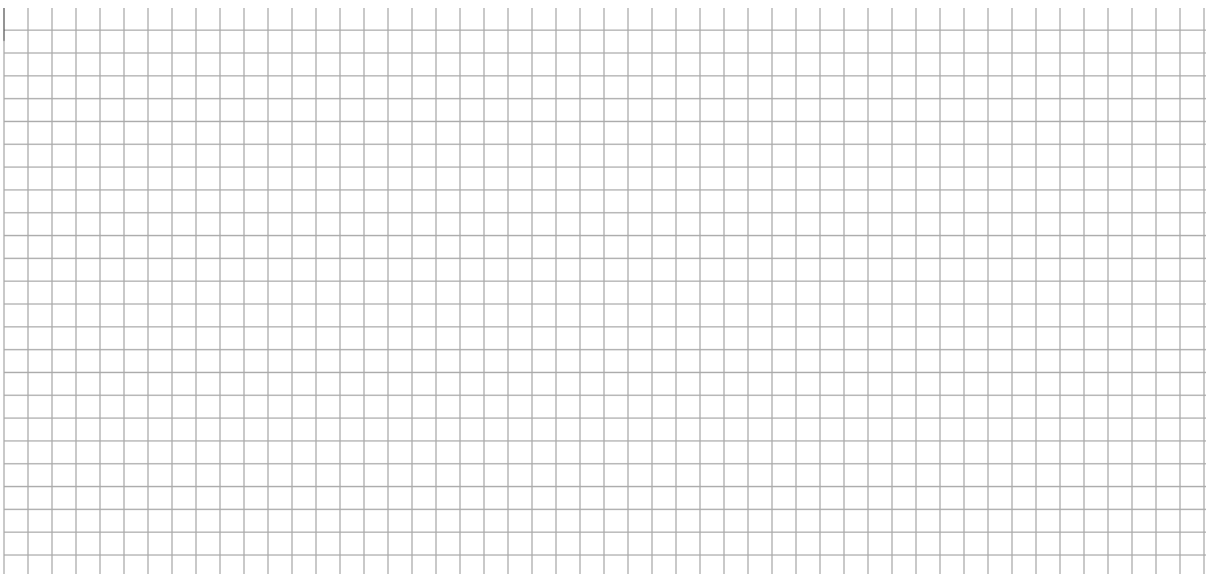


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7. A drone experiences a variable acceleration as follows: it accelerates from rest uniformly at a rate of 2 m/s^2 for the first **4 seconds**, then accelerates uniformly at a rate of 4 m/s^2 for the next **6 seconds**, and finally decelerates uniformly at a rate of 3 m/s^2 until it comes to a **stop**. Plot the velocity-time graph for this motion.



8. A car is traveling at a **constant velocity of -10 m/s** for **5 seconds**. Plot the velocity-time graph for this motion, considering the negative direction.



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