1) A horse running at 4.0 m/s accelerates uniformly to a velocity of 18 m/s in 4.0 s. What is its displacement during the 4.0 s time interval?

x Displacement	a acceleration	t time	Vo =Vi initial velocity	V = Vf Final velocity
?		**4.0 s**	**4.0 m/s**	**18 m/s**

Kinematic Equations for Motion with Constant Acceleration
$v = v_o + at$
$x = \frac{1}{2}(v_o + v)t$
$v^2 = v_o^2 + 2ax$
$x = v_o t + \frac{1}{2}at^2$

$$x = 1/2\ (Vi + V)\ t$$

$$x = 1/2\ (4.0 + 18\ )\ x\ 4$$

$$x = 1/2\ (22)\ x\ 4$$

$$x = 11\ x\ 4$$

$$x = 44\ m$$

Vi = Vo = 4.0 m/s

a = m/s^2

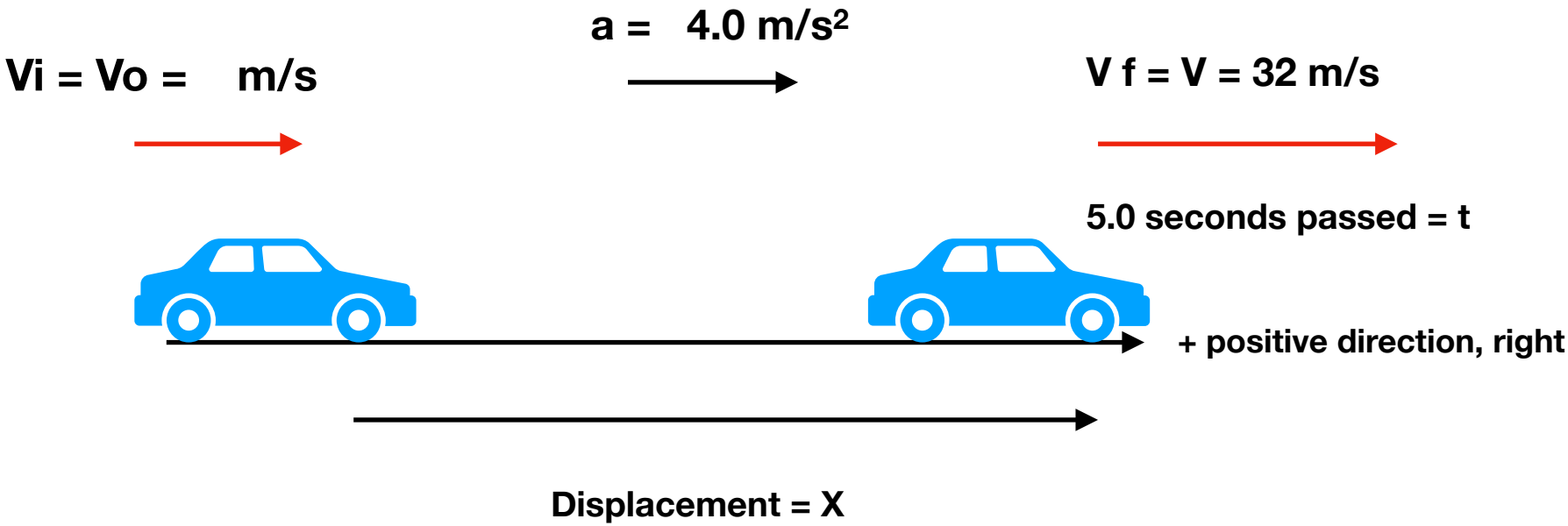
V f = V = 18 m/s

4.0 seconds passed = t

1) A car acquires a velocity of 32 m/s by accelerating at 4.0 m/s^2 for 5.0 s. What was its initial velocity?

x Displacement	a acceleration	t time	Vo =Vi initial velocity	V = Vf Final velocity
	4.0 m/s^2	**5.0 s**	**?**	**32 m/s**

Kinematic Equations for Motion with Constant Acceleration
$v = v_o + at$
$x = \frac{1}{2}(v_o + v)t$
$v^2 = v_o^2 + 2ax$
$x = v_o t + \frac{1}{2}at^2$


a = 4.0 m/s2
Vi = Vo = m/s
V f = V = 32 m/s
5.0 seconds passed = t
+ positive direction, right
Displacement = X

$$V_f = V_i + a \times t$$

$$32 = V_i + 4.0 \times 5$$

$$32 = V_i + 20$$

$$-20 \qquad -20$$

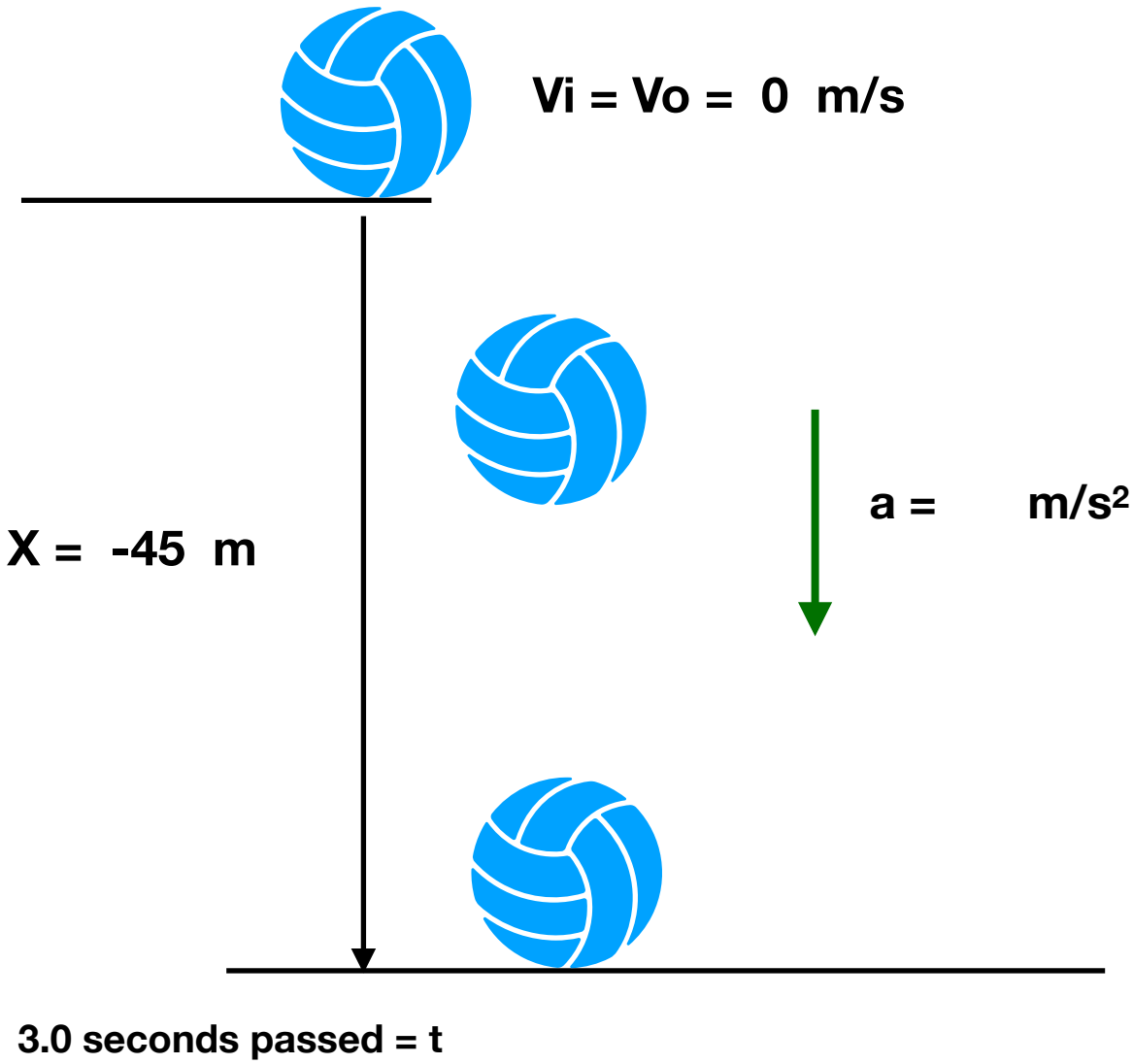
$$12 \text{ m/s} = V_i$$

3) A ball falling from rest is located at 45 m below its starting point 3.0 s later.

Assuming that its acceleration is uniform, what is its value?

x Displacement	a acceleration	t time	Vo =Vi initial velocity	V = Vf Final velocity
45 m	**? m/s²**	**3.0 s**	**Rest** **0 m/s**	

Kinematic Equations for Motion with Constant Acceleration
$v = v_o + at$
$x = \frac{1}{2}(v_o + v)t$
$v^2 = v_o^2 + 2ax$
$x = v_o t + \frac{1}{2}at^2$


Vi = Vo = 0 m/s
X = -45 m
a = m/s²
3.0 seconds passed = t

$$X = Vo\ t\ + 1/2\ a\ t^2$$

$$-45 = 0 \times 3 + 1/2\ a\ (3)^2$$

$$-45 = 0 + 1/2\ a\ (9)$$

$$-45 = 1/2\ a\ (\ 9)$$

$$-45 = 4.5\ a$$

$$-\frac{45}{4.5} = \frac{4.5}{4.5}\,a$$

$$-10\ m/s^2 = a$$

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