Name: _____ Block: _____

Motion #2

1. A runner accelerates from $8\frac{m}{s}$ north to $2\frac{m}{s}$ north over a period of $2\,s$. What is the runner's acceleration? What is the runner's displacement after the $2\,s$?

$\boxed{-3\frac{m}{s^2}}$

$\boxed{10\,m}$

2. A car is moving $15\frac{m}{s}$ east when it begins an acceleration towards the east of $3\frac{m}{s^2}$. How long will it take this car to reach a velocity of $30\frac{m}{s}$ east? How far will the car travel during this time?

$\boxed{5\,s}$

$\boxed{112.5\,m}$

3. A ball rolls along a steep hill. If the ball is rolling up the hill at $5\frac{m}{s}$ initially but accelerating down the hill at $2\frac{m}{s^2}$, what will be the ball's velocity after $4\,s$ of rolling? What will be the displacement of this ball?

$\boxed{-3\frac{m}{s}}$

$\boxed{+4\,m}$

4. A car accelerates from 0 to $30\frac{m}{s}$ in 6 s during an acceleration test. What will be the car's speed 2 s into the test, if the acceleration of the car is uniform? How far will the car move in the first 4 s of the test?

$10\frac{m}{s}$

$40\,m$

5. A car moving at $15\frac{m}{s}$ north needs to stop in 50 m. What acceleration is required?

$-2.25\frac{m}{s^2}$ south

6. What is the displacement of a car that starts at $10\frac{m}{s}$ east and accelerates at $3\frac{m}{s^2}$ west for 2 s?

$+14\,m$ east

7. A landing airplane touches down at $50\frac{m}{s}$. The plane begins slowing down at $5\frac{m}{s^2}$ what will be the velocity of the plane after it has traveled 100 m down the runway?

$38.7\frac{m}{s}$