

Calculating Average and Instantaneous Velocity - Solutions

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| <p>1.) Calculate the velocity of a car that can go 130 feet in 30 seconds. Give the answer in Meters/sec.</p> <p>$d = 130 \text{ ft} = 39.6 \text{ m}$ ($1 \text{ ft} = 0.3048 \text{ m}$) $t = 30 \text{ s}$ $v = v$</p> <p>$v = d / t$</p> <p>$v = 39.6 / 30 \text{ s}$</p> <p>$v = 1.32 \text{ m/s}$</p> | <p>4.) <i>TGV</i> (Train à Grande Vitesse) is a world record high speed train. The TGV has reached a speed of 515.3 km/h. How long would it take the train to circumnavigate the Earth at its equator (24,830 miles)?</p> <p>$d = 24,830 \text{ mi} = 39,976.3 \text{ km}$ ($1 \text{ mi} = 1.61 \text{ km}$) $t = t$ $v = 513.3 \text{ km/h}$</p> <p>$v = d / t$</p> <p>$513.3 = 39976.3 / t$ or $t = 39,976.3 / 513.3$</p> <p>$t = 77.88 \text{ hrs}$</p> |
| <p>2.) If a woman runs at an average speed of 7.3 mph, how far would she get in 1 minute? Find it in meters per second (m/s).</p> <p>$d = d$ $t = 60 \text{ s}$ $v = 7.3 \text{ mph} = 3.26 \text{ m/s}$ ($1 \text{ mi} = 1.61 \text{ km}$) $7.3 \text{ mph} \times 1.61 = 11.753 \text{ km}$ $= 11753 \text{ m}$ $1 \text{ hr} \times 60 = 60 \text{ min} \times 60 \text{ s} = 3600$ $11753 / 3600 = 3.26 \text{ m/s}$</p> <p>$v = d / t$</p> <p>$3.26 = d / 60 \text{ s}$ or $d = (60)(3.26)$</p> <p>$d = 195.6 \text{ m}$</p> | <p>5.) A robot travels 20m in 3.4s what is the robots average velocity?</p> <p>$d = 20 \text{ m}$ $t = 3.4 \text{ s}$ $v = v$</p> <p>$v = d / t$</p> <p>$v = 20 / 3.4$</p> <p>$v = 5.88 \text{ m/s}$</p> |
| <p>3.) The highest speed solar powered vehicle has a top speed of 48.71 mph. At that speed, how far could it go in 3 hours? Answer in meters per second.</p> <p>$d = d$ $t = 3 \text{ hrs} = 10,800 \text{ s}$ $v = 48.71 \text{ mph} = 21.78 \text{ m/s}$ $48.71 \times 1.61 = 78.4 \text{ km} = 78400 \text{ m}$ $1 \times 60 \times 60 = 3600 \text{ s}$</p> <p>$v = d / t$ or $d = vt$</p> <p>$d = (21.78)(10,800 \text{ s})$</p> <p>$d = 235,224 \text{ m}$</p> | <p>6.) Measure your own average velocity? Mark off 50 yds. and using a stopwatch, measure your own average velocity in (m/s) then in miles per hour (mph).</p> <p>Depending on your data.</p> <p>Use $v = d / t$</p> <p>Find and use an online conversion calculator to convert feet/sec to mph and meters/sec.</p> <p>Here is a very useful conversion resource: http://www.onlineconversion.com/</p> |