

1. (4 points) A small rock in a sling shot starts at rest and is pulled back 35 cm from where it leaves the slingshot traveling at 28 m/s. What is the magnitude of the acceleration of the rock?
2. (4 points) Sam is moving on his skateboard 6.0 m/s east and speeds up to 12 m/s east in 14 s. What is Sam's displacement during this time interval (while he is accelerating)?
3. Sam shoots a bullet straight up at 368 m/s.
 - (a) (2 points) Ignoring air resistance, what height does the bullet reach?
 - (b) (2 points) How long is the bullet in the air for before it hits the ground?

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4. (4 points) Juan Miguel is jogging south on his favourite train which is moving north at 23 m/s. If Juan Andres, who is floating north up a river at 6.0 m/s, sees Juan Miguel moving 12 m/s, how fast is Juan Miguel jogging with respect to the train?
5. (4 points) A boat that can travel 25 m/s in still water points east across a river that is flowing south at 8.0 m/s. If the boat crosses the river, what will be its resultant velocity during the trip?
6. (2 points) Bonus: A ball is dropped from rest at height h . Another ball is simultaneously thrown downward with speed v from height $2h$. What should v be (in terms of g and h) so that balls hit the ground at the same time? (hint: $t_1 = t_2$)