I'm Free Falling! **Name _____**

Using the formulas below, calculate the sight distance and free falling times based on height traveled. Show work for each of these. Escape velocity problem is extra credit. (Note: Escape velocity is the velocity required for an object to break free of a plant or star's gravity so it can move into space.)

Escape Velocity	Sight distance	Free falling times
$\sqrt{\frac{2GM}{R}}$ Where G = gravitational Constant (6.67390×10^{-11}) M = mass of planet Or star R = radius of planet or star	$d = \sqrt{\frac{3h}{2}}$ d = distance h = height	$t = \sqrt{\frac{h}{4}}$ t = time h = height
1. If $M = 4.5 \times 10^{10}$ and $R = 3.2 \times 10^{6}$ What is the escape velocity for this star?	2. If the Eiffel Tower is 984 feet high, how far can you see on a clear day?	3. If I am falling from a height of 2500 feet, how long will it take to reach the ground?

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Answer key

Using the formulas below, calculate the sight distance and free falling times based on height traveled. Show work for each of these. Escape velocity problem is extra credit. (Note: Escape velocity is the velocity required for an object to break free of a plant or star's gravity so it can move into space.)

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Escape velocity is 1.3×10^{-3}	***distance is 38.42 feet***	***time is 12.5 seconds***