$^{8}/_{10}$

A10 Proportionality

A10.1 If $V \propto I$ and $I = 0.35$ A when $V = 9.6$ V, what will V be when $I = 0.90$ A?

A10.2 If $E \propto v^2$ and $E = 94$ J when $v = 6.5$ m/s, what will E be when $v = 12$ m/s?

A10.3 If $g \propto 1/r^2$ and $g = 9.8$ N/kg when $r = 6400$ km, what will g be when $r = 15000$ km?

A10.4 If $E \propto x^2$ and $E = 2.5$ J when $x = 1.5$ cm, what will x be when $E = 6.0$ J?

A10.5 If $V \propto 1/r$ and $V = 5000$ V when $r = 7.0$ cm, what will r be when $V = 2000$ V?

A10.6 If $m = \rho a^3$ and $m = 28$ g when $a = 2.5$ cm, what will m be when $a = 8.7$ cm if ρ doesn't change?

A10.7 If $I = P/V$ and $I = 5.2$ A when $V = 230$ V, what will I be when $V = 115$ V if P doesn't change?

A10.8 If $I = P/(4\pi r^2)$ and $I = 6.0$ W/cm^2 when $r = 3.0$ m, what will r be when $I = 0.30$ W/cm^2 if P doesn't change?

A10.9 If $R = \rho L/A$, and $R = 5.0\ \Omega$ when $L = 65$ m and $A = 2.5$ mm^2, what will R be when $L = 120$ m and $A = 1.5$ mm^2 if ρ doesn't change?

A10.10 If $g = GM/r^2$ and $g = 9.8$ N/kg when $M = 6 \times 10^{24}$ kg and $r = 6400$ km, what will M be if $g = 1.7$ N/kg and $r = 1700$ km if G doesn't change?