Quiz 14 – Newton's Second Law – 11-03-03

A 600 N rocket's engines are exerting a thrust of 800 N.
(a) Use the weight equation to calculate its mass.
(b) Draw the physical diagram.
(c) Draw and label the FBD.
(d) Use Newton's second law to derive the equation for its acceleration.
(e) Substitute the correct values into the equation and solve for the value of the accleration.

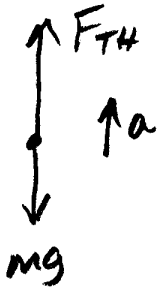
$F_g = Mg$

$M = \frac{F_g}{g}$

$= \frac{600N}{9.8 \frac{M}{S^2}}$

a) $\boxed{M = 61.2 kg}$

b) 

c) 

Note: DON'T use F_N or F_T for the thrust of a rocket

$\Sigma F = Ma$

$F_{TH} - Mg = Ma$

d) $\boxed{a = \frac{F_{TH} - Mg}{M}}$

$a = \frac{F_{TH} - Mg}{M}$

$= \frac{800N - 600N}{61.2kg}$

e) $\boxed{a = 3.27 \frac{M}{S^2}}$

Note! Answers boxed with letter of problem out front. Units on ALL measurements and answers. Algebra first, substitution later.