NEWTON'S 2ND LAW

Units 6 &7 Dr. John P. Cise, Professor of Physics, Austin Com. College, Austin Texas, USA jpcie@austincc.edu & New York Times , February 6, 2018 by Kenneth Chang. Dedicated to Mr Heart, My Physics Prof.

Falcon Heavy, in a Roar of Thunder, Carries SpaceX's Ambition Into Orbit

By KENNETH CHANGFEB. 6, 2018

Watch the SpaceX Falcon Heavy Launch

By SPACEX, VIA REUTERS

Continue reading the main storyVideo

Watch the SpaceX Falcon Heavy Launch

The success of this launch gives SpaceX momentum to begin developing even larger rockets, which could help fulfill Elon Musk's dream of sending people to Mars. By SPACEX, VIA REUTERS. . Watch in Times Video » KENNEDY SPACE CENTER, Fla. — From the same pad where NASA launched rockets that carried astronauts to the moon, a big, new American rocket arced into space on Tuesday. But this time, NASA was not involved. The rocket, the Falcon Heavy, was built by SpaceX, the company founded and run by the billionaire entrepreneur Elon Musk. "It seems surreal to me," Mr. Musk said during a news conference after the launch.The launch of this turbocharged version of the workhorse Falcon 9 rocket, which has been carrying cargo to space for years, marks an important milestone in spaceflight, the first time a rocket this powerful has been sent into space by a private company rather than a government space agency."It's kind of silly and fun, but silly and fun things are important," Mr. Musk said. The success gives SpaceX momentum to begin developing even larger rockets, which could help fulfill **Mr. Musk's dream of sending people to Mars. To do that, he has described a new-generation rocket called B.F.R. (the B stands for big; the R for rocket) that might be ready to launch in the mid-2020s.** The near-flawless performance of the Heavy on Tuesday "gives me a lot of confidence we can make the B.F.R. design work," "Races are exciting."

27 rockets of Heavy Space X = thrust = 5.13×10^6 lb.

Weight at launch of entire Heavy (with initial fuel) = 3.125×10^6 lb.

INTRODUCTION: **In this application you will confirm acceleration at launch by Newton's second law with kinematics concepts.**

QUESTIONS: **(a) Find mass(in slugs) of entire Heavy at launch?, (b) Find NET force ON heavy rocket (Thrust – weight) at launch?, (c) Find acceleration (in ft./s.^{2} and m./s.^{2} note: 0.305 m./ft.) of Rocket at launch?, (d) Space X data at launch shows In the first 1.4 km. after launch the rocket was traveling at 463 km./hr. With this data find the acceleration of heavy rocket at launch? (e)How well does (c) & (d) compare?**

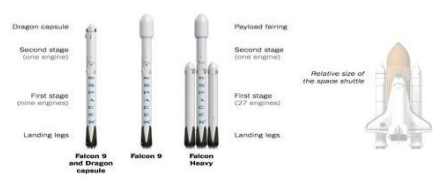
HINTS: **W = m g, F_{NET} = m a , $v^2 = v_0^2 + 2\,a\,x$, km. = 1000 m., 3600 s./hr.**

ANSWERS: **(a) 97,656 slugs, (b) 2,004,265 lb.,(c) ~20.52 ft./s.^{2} or 6.25 m./s.^{2} (d) ~ 5.9 m./s.^{2} , (e) Using Newton's 2nd law vs. kinematics compare well.**

COMMENTS: **Very exciting are launch videos + animations at U Tube**

Elon Musk, the founder of SpaceX, on Monday at Launch Pad 39A at the Kennedy Space Center in Florida, where the Falcon Heavy rocket launched on Tuesday afternoon.

Mr. Musk's visions include humans living both on Earth and Mars. He's part of a new generation of entrepreneurial space pioneers that includes Jeffrey P. Bezos, the founder of Amazon, who has said one of the goals driving his rocket company, Blue Origin, is the prospect of millions of people living in space. Planetary Resources, an American company with a large investment from Luxembourg, hopes to mine asteroids for profit. Moon Express, based in Florida, sees a business in providing regular transportation to and from the moon.



All boosters and main rocket successfully returned to earth February 6, 2018. Mars here Space is coming…….