Grade 9 Mathematics Worksheet

Rate and functions

Questions:

1. With new technology in the space age, it is not strange to watch a blow by blow account of countries being at war. Weapons that are often used are aircraft which are based on aircraft carriers.

    These aircrafts are rocketed forward by a steam driven system. This system can rocket a 20,000 kg plane from 0 to 266 km/h in two seconds.

    a)   Give this acceleration as a rate in metres per second.

    b)   If the altitude above sea level increases at a rate of 29 m/s as the aircraft increases its altitude, how long will it take for the aircraft to reach 9 000m above sea level if the carrier is 27 m high?

    c)   The maximum speed of these aircraft is 3 times the speed of sound. If the speed of sound is 340,29 m/s, how long will it take the aircraft to reach this maximum speed?

Solution:

1. a)   0 to 266 km/h in two seconds:

$$\frac{266 \times 1000}{3600} = 73,\dot{8}\, m/s\,.$$

   b) $\dfrac{9000-27}{29} = 309,41 = 310\,\sec$

   c)   Max speed is: 3 x 340,29 m/s = 1 020,87 m/s.
   Thus: $\dfrac{1020,87}{29} = 35,2\,\sec$