Inverse Variation

1) The fan pulley and an alternator pulley are connected by a fan belt on an automobile engine. The fan pulley is 225 cm in diameter and the alternator pulley is 125 cm in diameter. If the fan pulley turns at 500 rpm, how many revolutions per minute does the faster alternator pulley turn?

2) The volume of a certain gas is inversely proportional to the pressure on it. If the gas has a volume of 160 in^3 under pressure of 20 lb per square inch (psi), what is the volume if the pressure is decreased to 16 psi?

3) A pulley that measures 15 in. across (diameter) turns at 1600 rpm and drives a larger pulley at the rate of 1200 rpm. What is the diameter of the larger pulley in this inverse relationship?

4) Six painters can trim the exterior of all the new brick homes in a subdivision in 9 weeks. The contractor wants to have the home ready in just 3 weeks and so he needs more painters. How many painters are needed for a job if they all work at the same rate?

5) Two groundskeepers take 25 h to prepare a golf course for a tournament. How long will it take five groundskeepers to prepare the golf course?

6) A gear measures 5 in. across. It turns another gear 2.5 in. across. If the larger gear has a speed of 25 rpm, what is the speed of the smaller gear?

7) A small pulley 3 in. in diameter turns 250 rpm and drives a pulley at 150 rpm. What is the diameter (distance across) of the larger pulley?

8) Two painters painting at the same speed can paint 800 ft^2 of wall space in 6 h. If a third painter paints at the same speed, how long will it take all three painters paint the wall space?

9) Three machines complete a printing project in 5 h. How many machines are needed to finish the same project in 3 h?

10) A gear measures 6 in. across. It is in mesh with another gear with a 3 in. diameter. If the larger gear has a speed of 60 rpm, What is the rpm of the smaller gear?