

Section 6.5 Practice Master

1. A model rocket is launched from the deck in Jim's backyard and the path followed by the rocket can be modelled by the relation $h = -5t^2 + 100t + 15$, where h , in metres, is the height that the model rocket reaches after t seconds.
 - a) What is the height of the deck?
 - b) What is the height of the model rocket after 2 s?
 - c) What is the maximum height reached by the model rocket?
 - d) How long did the model rocket take to reach this height?
 - e) How long was the model rocket above 200 m, to the nearest second?
 - f) Estimate how long the model rocket was in the air.
2. A harbour ferry service has about 240 000 riders per day for a fare of \$2. The port authority wants to increase the fare to help with increasing operational costs. Research has shown that for every \$0.10 increase in the fare the number of riders will drop by 10 000. The port authority established a relation defined by $R = -1000p^2 + 4000p + 480\,000$, where R represents the revenue from fares and p represents the number of \$0.10 increases in the fare.
 - a) What increase in the fare will maximize the revenue?
 - b) What is the new fare?
 - c) What is the revenue that will be received from the new fare?
3. A rectangular lawn measures 30 m by 40 m. Jason is cutting the lawn from the outside perimeter in toward the centre by cutting strips along the entire perimeter first, then continuing as he cuts toward the centre. How wide is the strip that has been cut along the outside when the area is half cut?
4. The hypotenuse of a right triangle measures 13 cm. The legs of the triangle differ by 7 cm. Find the length of each leg.
5. A triangle has an area of 308 cm^2 . If the base is 2 cm more than three times the height of the triangle, find the base and height of the triangle.
6. The sum of the squares of four consecutive integers is 630. Find the integers.
7. Twice the width of a rectangle is 3 m more than the length. If the area of the rectangle is 209 m^2 , find the dimensions of the rectangle.
8. The playing field at the local high school measures 140 m by 50 m. By increasing this rectangular area by the same amount on all sides, the new area will be exactly double the area of the field. By how much was each dimension increased, to the nearest metre?