

Real-Life Application: When Will I Ever Use This?

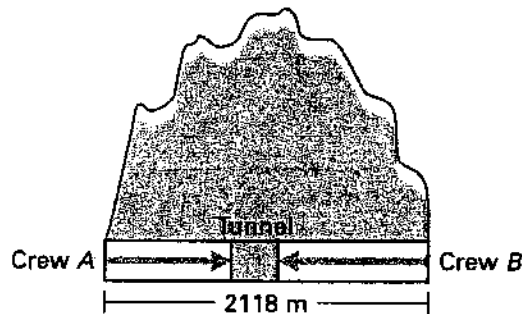
For use with pages 160–165

Tunnels

A tunnel is a passage or roadway used for various purposes, including highway traffic, railroads, and subways. Although ancient civilizations used tunnels to carry water for irrigation or for drinking, the advent of the railroad and the motor vehicle marked a widespread expansion in the number and the length of tunnels.

Historically, tunnel building has been a long and dangerous endeavor, often claiming many lives in the process. Modern tunneling advancements, however, have not only increased the efficiency of construction, but have also greatly improved worker safety. Improved boring and drilling machines like the rock drill and the mole now allow a tunnel to be driven 4 or 5 times faster than with older techniques. In addition, lining tunnels with concrete or plastic sealers minimizes the danger of leaking water, which can cause delays, equipment damage, and even collapse.

Boring Brothers, Inc. has a contract to dig a tunnel through a mountain to accommodate the construction of a major highway. Crew A starts at the west end and digs at a rate of 9 meters per day. Crew B starts at the east end two days after Crew A and digs at a rate of 12 meters per day.



In Exercises 1–4, use the information above.

- Let x be the number of days Crew A has been digging. Write an expression for the number of meters Crew A has dug after x days.
- In terms of x , how many days has Crew B been digging? Write an expression for the number of meters Crew B has dug in this number of days.
- Write and solve an equation to find how many days it will take for both crews to dig the same number of meters.
- The total length of the tunnel is to be 2118 meters. Write an equation stating this fact. Then solve the equation to find how many days it takes to dig the tunnel from the time Crew A starts.