

**Section 8-1: Direct Variation**

- ❖ Know how to write a direct equation of the form " $y = k \cdot x$ " using variables related to the problem.
- ❖ Know how to isolate  $k$ , then set up and solve a proportion for the missing piece of information.

**Practice problems (8-1)**

For each problem, (A) write an equation for the relationship described using variables related to the problem and (B) set up and solve a proportion.

1. If  $h$  varies directly as  $m$ , and  $m = 35$  when  $h = 7$ , find  $m$  when  $h = 11$ .
2. The stretch of a spring varies directly as the mass hanging on it. If a spring extends 13 cm with a mass of 100 g, how far will it extend with a mass of 28 g?
3. A real estate agent made a commission of \$2232 on a sale of \$124,000. At this rate, how much commission will she earn on the sale of a property for \$160,000?

**Section 8-2: Inverse and Joint Variation**

- ❖ Know how to convert a statement such as " $y$  varies inversely as  $x$ " into an equation of the form " $x \cdot y = k$ " using variables related to the problem.
- ❖ Know how to convert a statement such as " $z$  varies directly as  $x$  and inversely as  $y$ " into an equation of the form  $z = \frac{kx}{y}$ , then solve the problem by isolating  $k$  and setting up and solving a proportion.
- ❖ Know how to convert a statement such as " $z$  varies jointly as  $x$  and  $y$ " into an equation of the form  $z = k \cdot x \cdot y$ , then solve the problem by isolating  $k$  and setting up and solving a proportion.

**Practice problems (8-2)**

For each problem, (A) write an equation for the relationship described using variables related to the problem and (B) set up and solve a proportion.

4. If  $y$  varies inversely as the square of  $x$ , and  $y = 2$  when  $x = 12$ , find  $x$  when  $y = 8$ .
5. Suppose  $I$  varies jointly as  $p$  and  $r$ . If  $I = 14$  when  $p = 100$  and  $r = 0.07$ , find  $p$  when  $I = 48$  and  $r = 0.08$ .
6. The intensity of light in lux is inversely proportional to the square of the distance from the light source. If the intensity is 30 lux at 6.4 m from the source, what is the intensity 16 m from the source?
7. The stretch of a wire under a given tension varies directly as its length and inversely as the square of its diameter. If the length of wire is doubled and its diameter is doubled, by how much does the stretch change? (Hint: just let the original length and original diameter be 1 each).