Inverse Proportionality
Use What You've Learned
Answers and Explanations

Use a table to solve each problem. Briefly explain or show your reasoning.

1. Qualitek is a company that makes industrial pins. There are usually six machines available, and the six machines can make a total of 300 pins in eight days. How long will it take three machines to make 300 pins? How long will it take one machine to make 300 pins? How long will it take 12 machines to produce 300 machines?

Number of Machines	Number of Pins	Number of Days
6	300	8
3	300	**16** If you have one half the number of machines, it will take twice as many days (8 x 2 = 16).
1	300	**48** Explanation 1: If you have one sixth the number of machines, it will take six times as many days (6 x 8 = 48). Explanation 2: If you have one third the number of machines, it will take three times as many days (3 x 16 = 48).
12	300	**4** Explanation 1: If you have two times the number of machines, it will take one half as many days (8 ÷ 2 = 4). Explanation 2: If you have twelve times as many machines, it will take one twelfth as many days (48 ÷ 12 = 4).

2. A herd of 100 dairy cows in California produces an average of 800 gallons of milk each day. Justin operates a dairy farm in California with 75 cows. On average, how much milk will Justin's cows produce in seven days? If Justin doubles his herd size to 150 cows, how long will it take to produce the same amount of milk that 75 cows produce in seven days?

Number of Cows	Gallons of Milk	Number of Days
100	800	1
75 (x $\frac{3}{4}$)	600 (x $\frac{3}{4}$)	1
75	4,200 (x 7)	7 (x 7)
150 (x 2)	4,200	3 1/2 (x $\frac{1}{2}$)

Justin's cows can produce an average of 4,200 gallons of milk in seven days.
If Justin doubles his herd to 150 cows, the herd can produce an average of 4,200 gallons of milk in 3½ days.