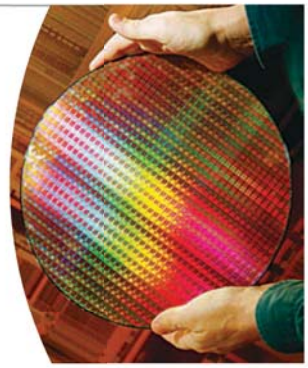
CHECKING FOR INVERSE VARIATION The general equation $y = \frac{a}{x}$ for inverse variation can be rewritten as $xy = a$. This tells you that a set of data pairs (x, y) shows inverse variation if the products xy are constant or approximately constant.

EXAMPLE 4 Check data for inverse variation



COMPUTER CHIPS The table compares the area A (in square millimeters) of a computer chip with the number c of chips that can be obtained from a silicon wafer.

- Write a model that gives c as a function of A.
- Predict the number of chips per wafer when the area of a chip is 81 square millimeters.

Area (mm^2), A	58	62	66	70
Number of chips, c	448	424	392	376

Solution

AVOID ERRORS
To check data pairs (x, y) for *direct* variation, you find the *quotients* $\frac{y}{x}$. However, to check data pairs for *inverse* variation, you find the *products* xy.

STEP 1 **Calculate** the product $A \cdot c$ for each data pair in the table.

$58(448) = 25{,}984$

$62(424) = 26{,}288$

$66(392) = 25{,}872$

$70(376) = 26{,}320$

Each product is approximately equal to 26,000. So, the data show inverse variation. A model relating A and c is:

$$A \cdot c = 26{,}000, \text{ or } c = \frac{26{,}000}{A}$$

STEP 2 **Make** a prediction. The number of chips per wafer for a chip with an area of 81 square millimeters is $c = \frac{26{,}000}{81} \approx 321$.

GUIDED PRACTICE for Example 4

8. WHAT IF? In Example 4, predict the number of chips per wafer when the area of each chip is 79 square millimeters.

KEY CONCEPT *For Your Notebook*

Joint Variation

Joint variation occurs when a quantity varies directly with *the product of two or more* other quantities. In the equations below, a is a nonzero constant.

$z = axy$ — **z varies jointly with x and y.**

$p = aqrs$ — **p varies jointly with q, r, and s.**