


EXAMPLE 6

on p. 554
for Exs. 31–33

WRITING EQUATIONS Write an equation for the given relationship.

31. x varies directly with y and inversely with z .
32. y varies jointly with x and the square of z .
33. w varies inversely with y and jointly with x and z .
34. **ERROR ANALYSIS** A variable z varies jointly with x and the cube of y and inversely with the square root of w . Describe and correct the error in writing an equation relating the variables.
- $$z = \frac{a\sqrt{w}}{xy^3}$$

35. **TAKS REASONING** Let $f(x)$ represent a direct variation function, $g(x)$ represent an inverse variation function, and $h(x)$ be the sum of $f(x)$ and $g(x)$. Write possible functions $f(x)$ and $g(x)$ so that $h(2) = 5$.
36. **CHALLENGE** Suppose x varies inversely with y and y varies inversely with z . How does x vary with z ? Justify your answer algebraically.

PROBLEM SOLVING**EXAMPLES 3 and 4**

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for Exs. 37–39

37. **DIGITAL CAMERAS** The number n of photos your digital camera can store varies inversely with the average size s (in megapixels) of the photos. Your digital camera can store 54 photos when the average photo size is 1.92 megapixels. Write a model that gives n as a function of s . How many photos can your camera store when the average photo size is 3.87 megapixels?

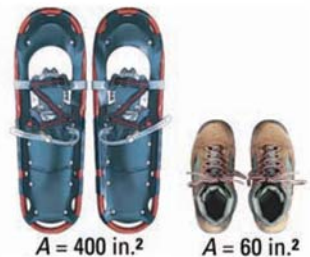
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38. **ELECTRONICS** The table below compares the current I (in milliamps) with the resistance R (in ohms) for several electrical circuits. Write a model that gives R as a function of I . Then predict R when $I = 34$ milliamps.

Current (milliamps), I	7.4	8.9	12.1	17.9
Resistance (ohms), R	1200	1000	750	500

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39. **SNOWSHOES** When you stand on snow, the average pressure P (in pounds per square inch) that you exert on the snow varies inversely with the total area A (in square inches) of the soles of your footwear. Suppose the pressure is 0.43 pound per square inch when you wear the snowshoes shown. Write an equation that gives P as a function of A . Then find the pressure if you wear the boots shown.



40. **MULTI-STEP PROBLEM** A piano string's frequency f (in hertz) varies directly with the square root of the string's tension T (in Newtons) and inversely with both the string's length L and diameter d (each in centimeters).
- The middle C note has a frequency of 262 Hz. The string producing this note has a tension of 670 N, a length of 62 cm, and a diameter of 0.1025 cm. Write an equation relating f , T , L , and d .
 - Find the frequency of the note produced by a string with a tension of 1629 N, a length of 201.6 cm, and a diameter of 0.49 cm.