# Extending Concepts

**Ordinary Interest** **In Exercises 21–24, use the information below.**

You borrow $4200 from a relative on January 5, 2012, to buy solar panels for your roof and windows with insulated glazing. The annual percentage rate is 8.9%. You agree to repay the loan on May 25, 2012.

**21.** Simple interest based on a 360-day year in which each month has 30 days is called *ordinary simple interest*. When using ordinary simple interest, you can use the formula below to find the number of days in a term from a month $M$, day $D$, and year $Y$ to a later month $m$, day $d$, and year $y$. (*Note:* January = 1, February = 2, etc.)

$$\text{Number of days} = 360(y - Y) + 30(m - M) + (d - D)$$

**a.** Use the formula to find the number of days in the term.

**b.** Find the total amount due using ordinary simple interest.

**22.** What is the actual number of days in the term? Find the total amount due using *exact* simple interest, as on page 256.

**23.** Which type of interest costs you more money? Will this always be true? Explain.

**24.** Do you think it is appropriate to use ordinary simple interest as an approximation of exact simple interest? Explain.

**25.** **Banker's Rule** The *Banker's Rule* is another type of simple interest that is similar to ordinary simple interest. It is based on a 360-day year, but you use the actual number of days in the term when calculating interest. Does this benefit the lender or the borrower? Explain.

Low-emissivity (Low-E) glazing on windows helps control heat transfer. These windows may cost 10%–15% more than traditional windows, but can reduce energy loss by 30%–50%.

**26.** **Loan Options** You have 3 loan options for borrowing $2500. You will repay the simple interest loan in 180 days.

| | Insurance premium | Annual percentage rate | Service charge |
|---|---|---|---|
| Loan A | 2% of loan proceeds | 25% | $39.50 |
| Loan B | 3% of loan proceeds | 26% | $0 |
| Loan C | $0 | 25% | $65.00 |

**a.** Find the interest for each loan.

**b.** Find the annual percentage rate of each loan, including the service charge.

**c.** Find the total amount due for each loan.

**d.** Which loan would you choose? Explain.