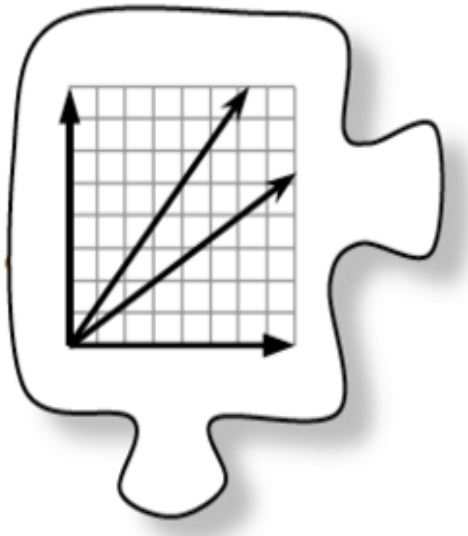
7.1.3 How can I find the rate?



Unit Rates

A **ratio** is a comparison of two quantities using division.	A **rate** is a ratio of two quantities with different units.	A rate with a denominator of 1 is called a **unit rate**.
$\frac{3}{4}$, 3 to 4, 3 : 4	$\frac{60 \text{ miles}}{2 \text{ hours}}$	$\frac{30 \text{ miles}}{1 \text{ hour}}$

News reporters use rates to provide important information. For example, when there is a sudden heavy rain, reporting the rate at which the local river is rising gives people a sense of how quickly it might flood. Sometimes rates are reported in words, such as, "*The pitcher struck out the batter with a ball thrown at 92 miles per hour.*" Other times, rates are provided in graphs or tables. For example, a graph or a table may be used to report the price of food over time or how rapidly a disease is spreading.

Today your team will develop strategies to find a rate in new contexts using tables and graphs.

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7-24. MAXIMUM MILES

The table below compares how many miles are traveled to how many gallons of gas are used for two different cars.

Fill in the missing values for each car. Then determine which car uses the least amount of gas.

Gas gallons)	Distance for Car A (miles)	Distance for Car B (miles)
0	0	0
3		54
5	150	
6	180	
10		180
12		

WRITE A RATE FOR EACH BOX SHOWN BELOW.

Box A

Box B

DETERMINE THE UNIT COST (Per Bar). Which Box offers a lower unit price?

Box A

Box B

7-26. Tamika and Lois like to knit. They have decided to knit a scarf using the same pattern. Tamika started knitting the scarf last week, but Lois is just starting now. The girls knit at different rates than each other, but each one's rate is constant. The tables below show information about the number of inches of scarf knitted per hour after Lois joins Tamika.

Tamika		Lois	
Time (in hours)	Length (in inches)	Time (in hours)	Length (in inches)
0		0	0
1	7	1	
2	9	2	6
3		3	

7-26.

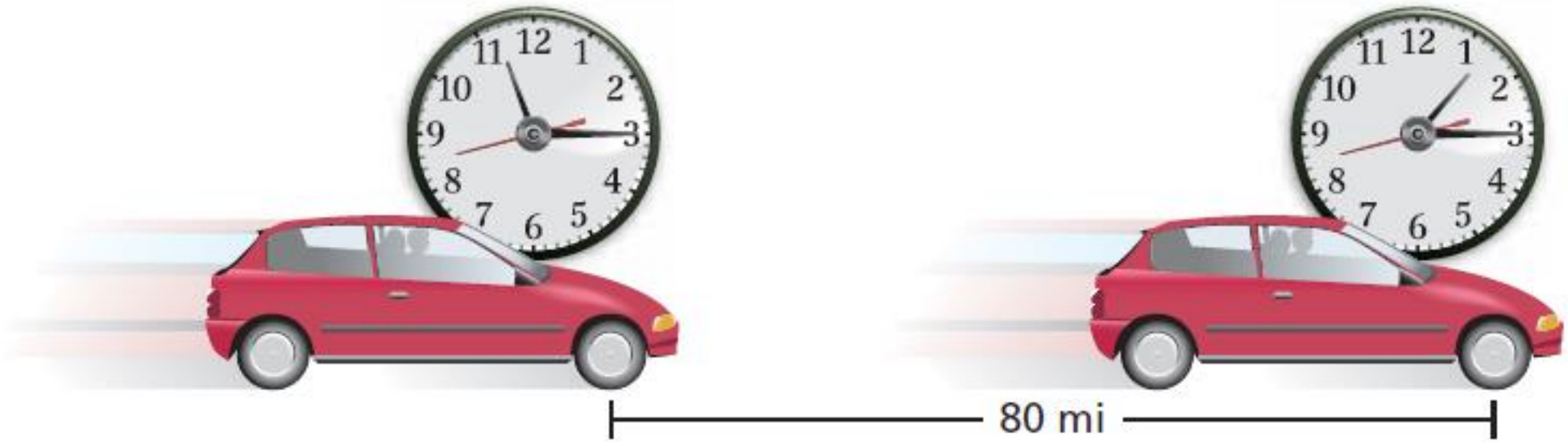
b. At what rate does Tamika knit? How can you use the table to find her rate?

c. At what rate does Lois knit? Explain how you found your answer.

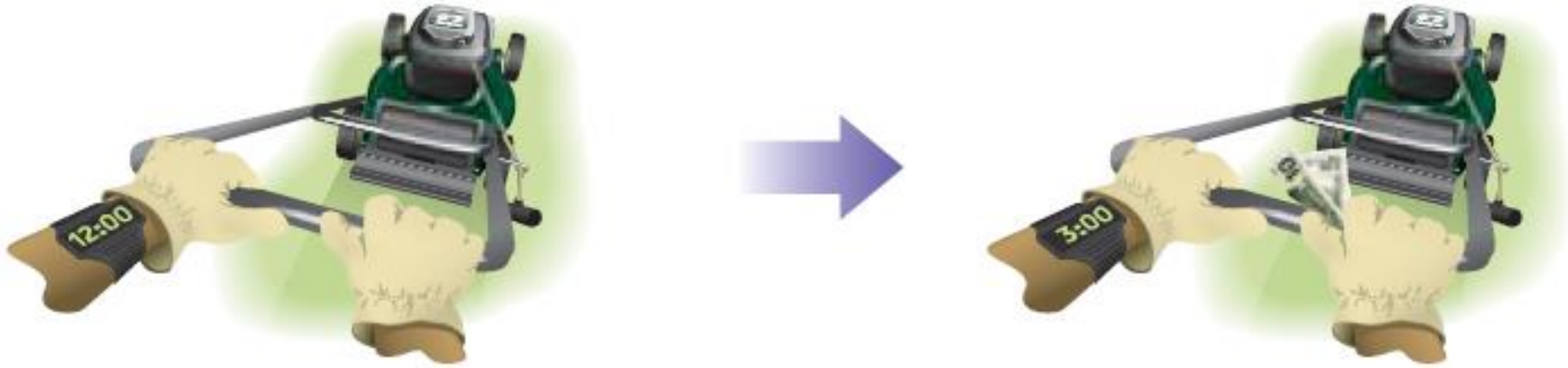
d. Lois decided that she wants her scarf to be 27 inches long. How long will it take her to complete the scarf?

- **Describe the story problem in your own words.**
- **Write the rate indicated by the diagram. What are the units?**
- **Rewrite the rate so that the denominator is 1. (This is called a *unit rate*.)**

a.



b.



Based on the size of the gas tank of each vehicle, determine their driving range (minimum / maximum) on a full tank of gas based off of their MPG figures given.

Compact
32 mpg City
40 mpg Highway

10.3 gallon tank

Full Size
20 mpg City
29 mpg Highway

17.5 gallon tank

SUV
13 mpg City
17 mpg Highway

25.0 gallon tank

Which vehicle can travel the farthest on one full tank of gas?

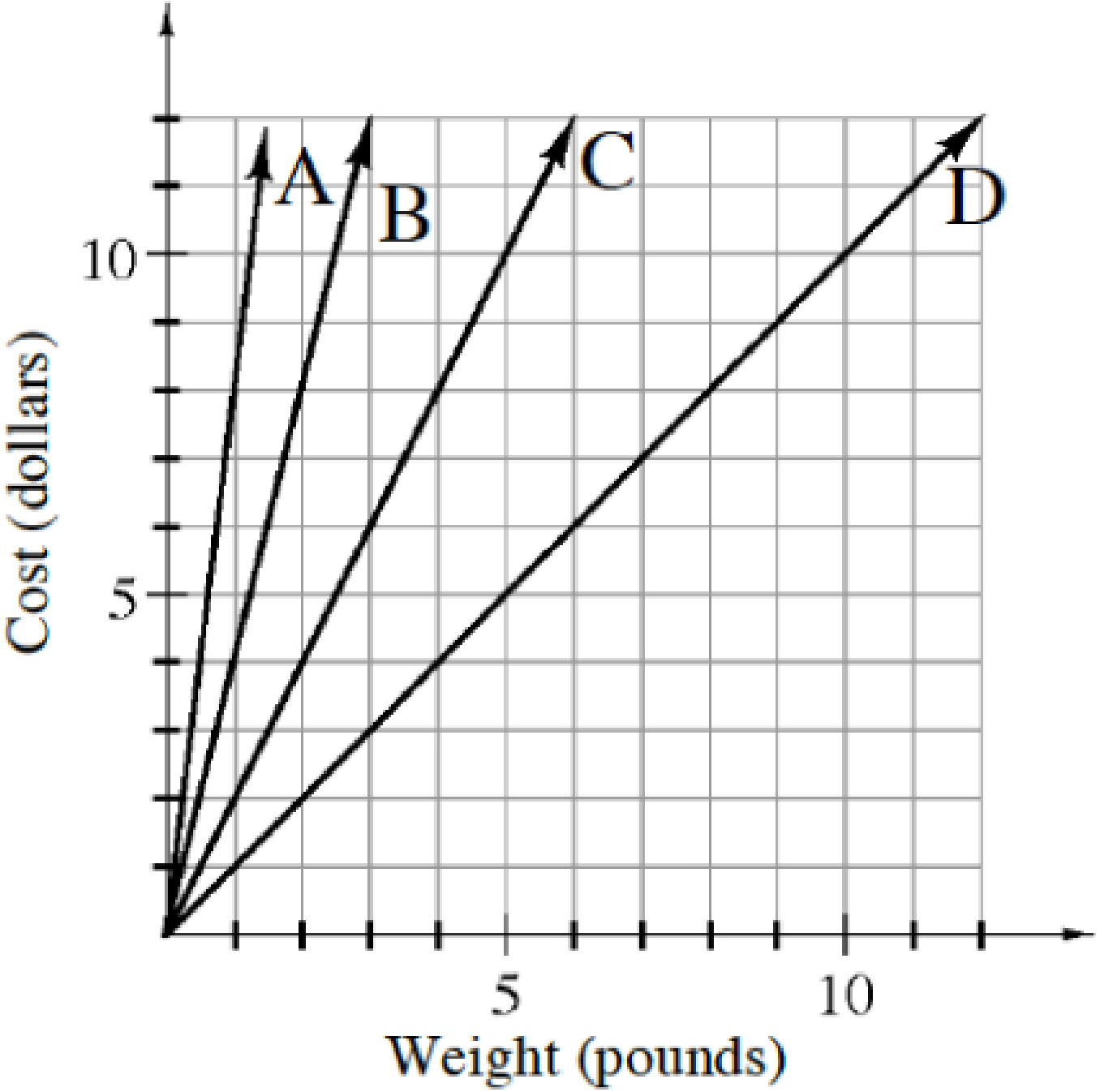
7-30. Which company offers the lowest unit rate per minute? Show how you decided.

Cell Phone Data Plans

Who has the best deal?

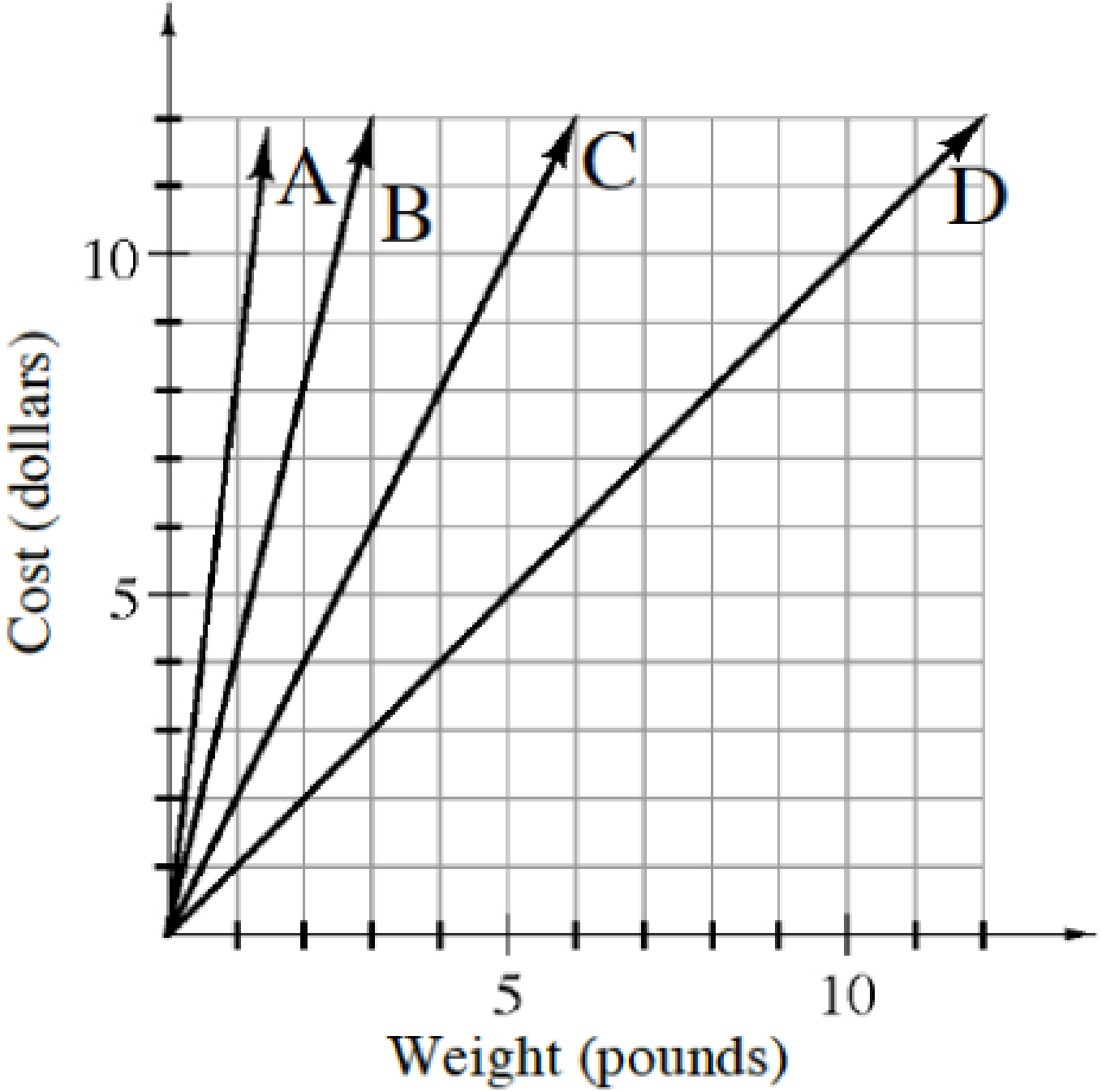
Company	Price	# of minutes
AB & C	$ 20.00	100
Berizon	$ 30.00	150
Cinguling	$ 18.00	60
DWest	$ 19.50	100

7-31. The graph at right shows the cost per pound of strawberries at four different stores.



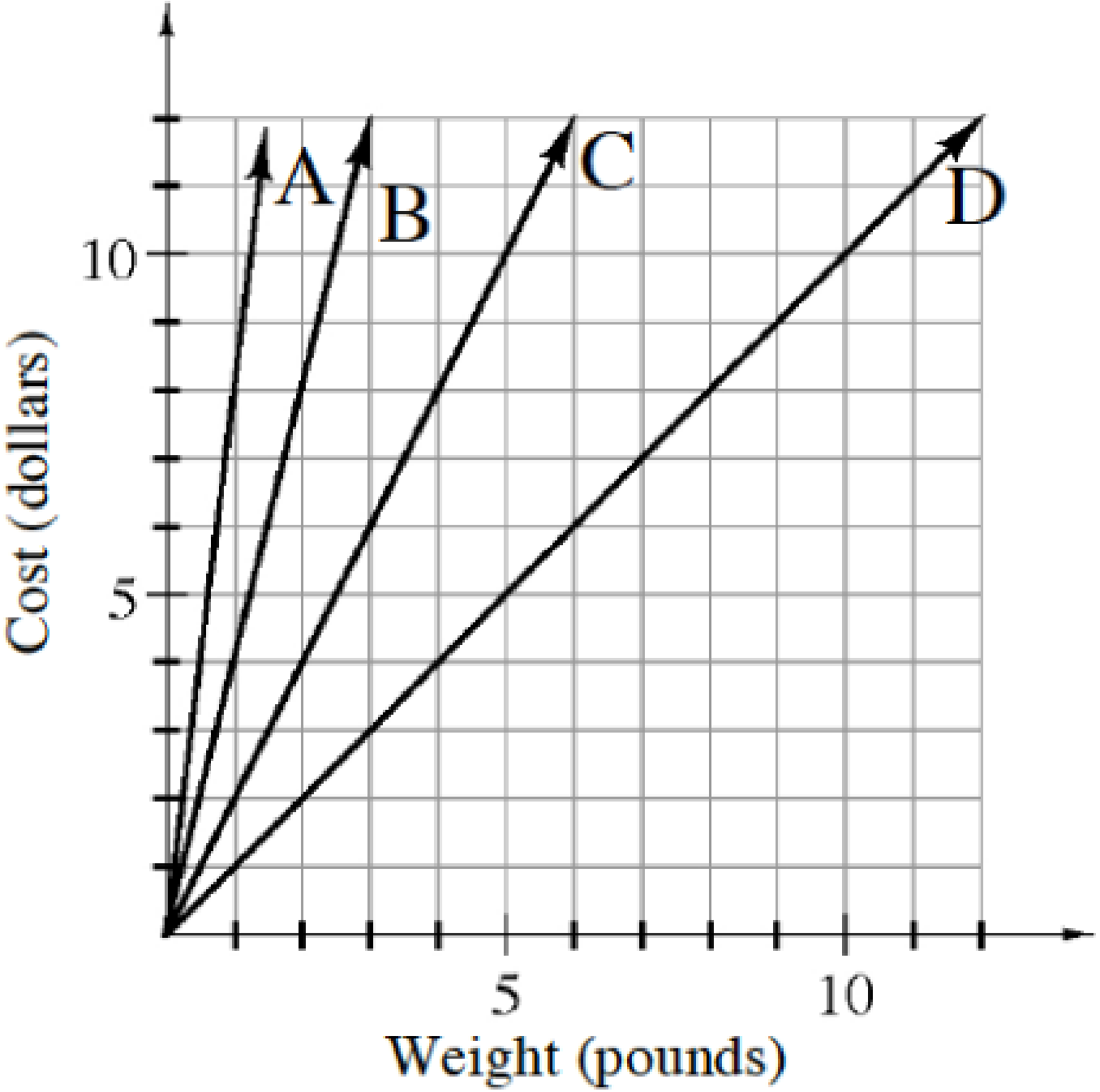
7-31.

At which store are strawberries about $2 per pound?



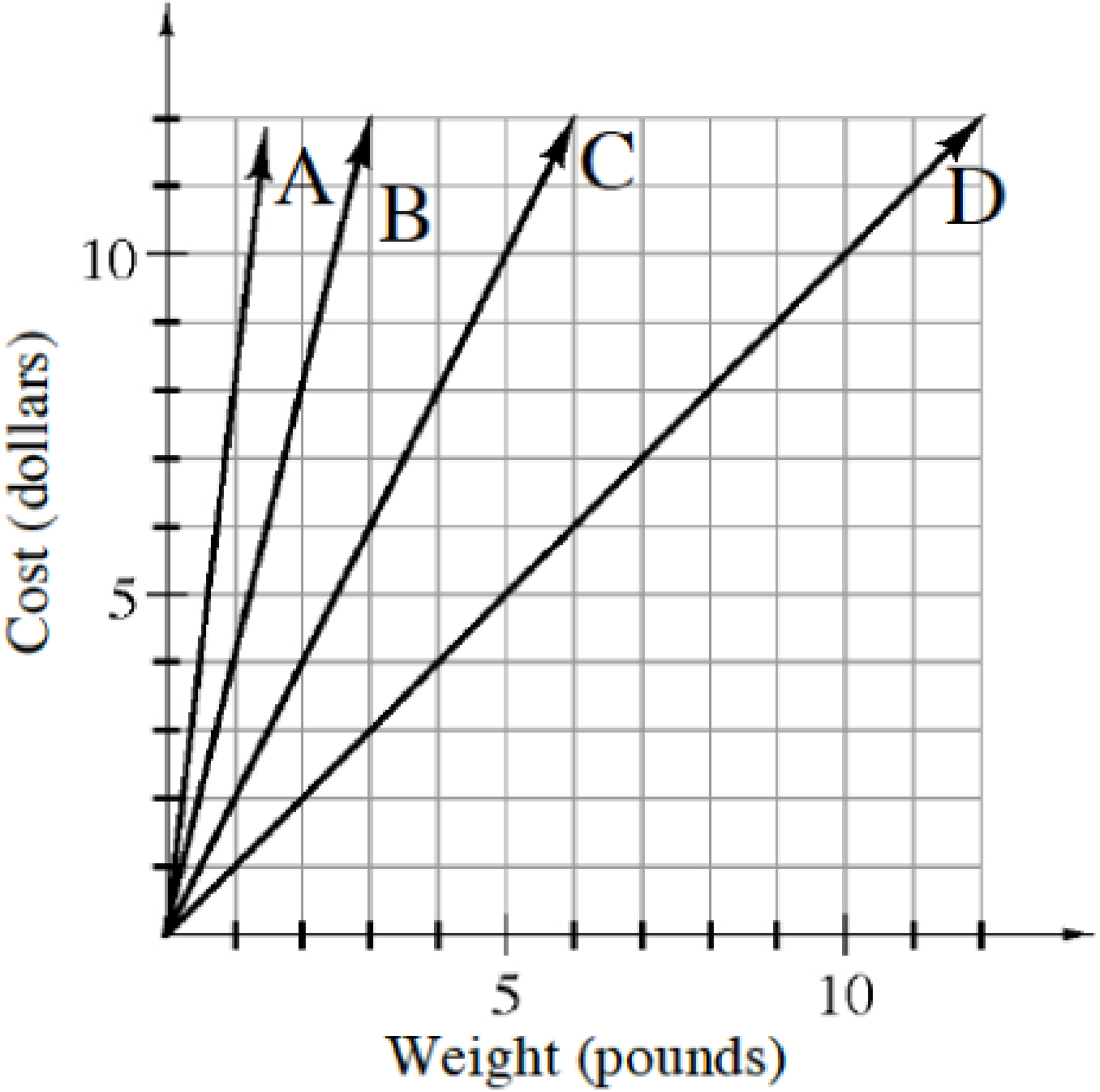
7-31.

What is the rate of cost of strawberries at store B?



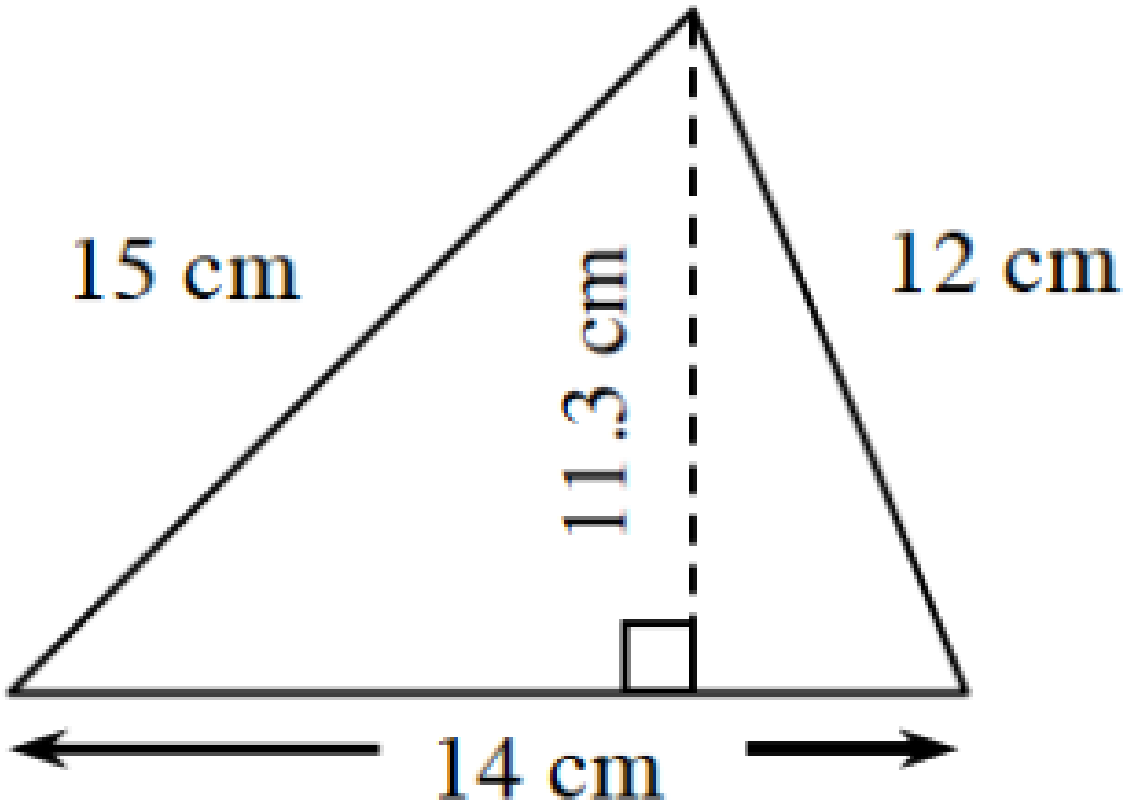
7-31.

Which store has the most expensive strawberries? How can you tell?



7-32. Find the perimeter and area of each triangle below.

a.

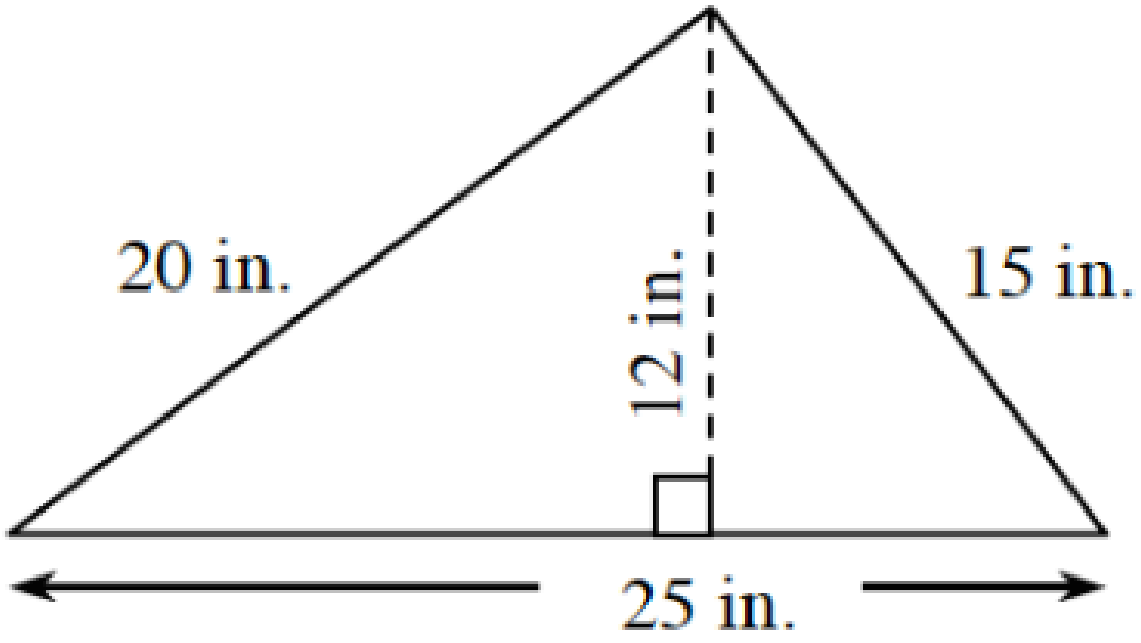


AREA:

PERIMETER:

7-32. Find the perimeter and area of each triangle below.

b.



AREA:

PERIMETER:

7-33. Arrange these numbers from greatest to least.

$$\frac{1}{3},\ 3,\ 0.3,\ 3\frac{1}{2},\ 0.03$$

7-34. Compute each sum or difference.

a. $\frac{11}{12} - \frac{2}{3}$

b. $\frac{3}{8} + \frac{7}{12}$

c. $\frac{9}{10} + \frac{5}{8}$