Applications Connections Extensions

ACE

Applications

Estimate each product.

1. 2.95×14.7 **2.** 0.491×120.2 **3.** 12.45×0.93

4. 0.52×18.3 **5.** 1.262×7.94 **6.** 0.82×0.302

For Exercises 7–12, estimate each product. Then find the exact product using fraction multiplication.

7. 0.6×0.8 **8.** 2.1×1.45 **9.** 3.822×5.2

10. 0.9×1.305 **11.** 5.13×2.9 **12.** 4.17×6.72

13. Sweety's Ice Cream Shop sells ice cream by weight. They charge \$2.95 per pound. Suppose your dish of ice cream weighs 0.42 pounds. How much will your ice cream cost?

14. Aaron plans to buy new flooring for his rectangular office. His office is 7.9 meters by 6.2 meters.

a. How many square meters of floor space does his office have?

b. Suppose flooring costs \$5.90 per square meter. How much will the new flooring cost for Aaron's office?

15. **Multiple Choice** Which of the products is greater than 1?

A. 2.4×0.75 **B.** 0.66×0.7 **C.** 9.8×0.001 **D.** 0.004×0.8

16. What number times 9 gives each product?

a. 45 **b.** 4.5 **c.** 0.45

Find the value of N.

17. $3.2 \times N = 0.96$ **18.** $0.7 \times N = 0.042$ **19.** $N \times 3.21 = 9.63$

20. **Multiple Choice** Which of the products is the greatest?

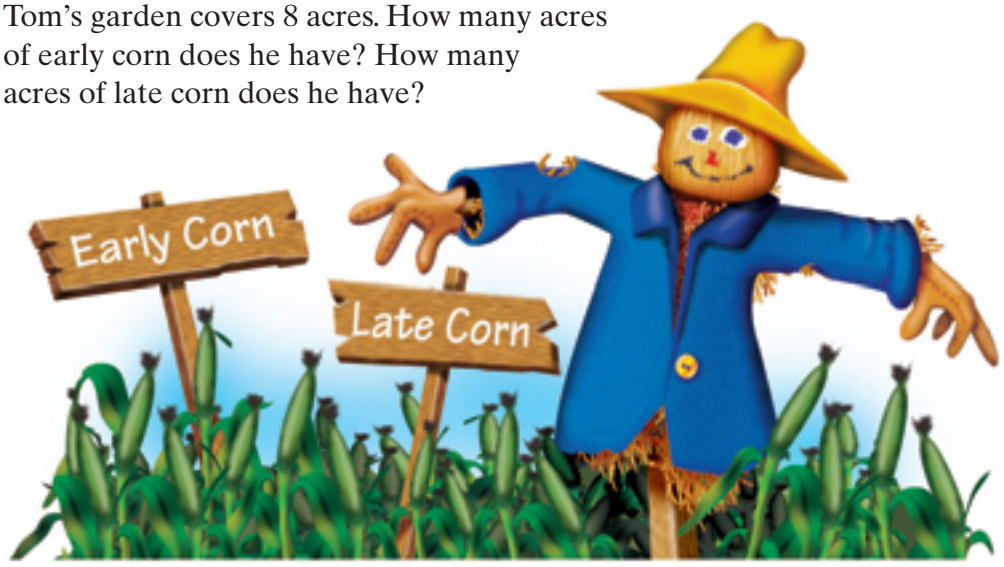
F. 0.6×0.4 **G.** 0.06×0.04

H. 0.06×0.4 **J.** 0.6×0.04

21. Tom plants corn in 0.4 of his vegetable garden. Of the corn section, 0.75 is early sweet corn and the rest is later-maturing sweet corn.

a. What part of his garden does Tom plant in early corn? What part does he plant in late corn?

b. Tom's garden covers 8 acres. How many acres of early corn does he have? How many acres of late corn does he have?



22. Ali sometimes finds it easier to estimate products by using the fractional equivalent of decimal numbers. What do you think he said for the missing numbers below?

"In estimating 0.52 × 18.3, 0.52 is about 0.5, which as a fraction is the same as ■. And, I can round 18.3 to 18. So, ■ of ■ is ■."

"For 1.262 × 7.94, I can round the numbers to 1.25 × 8. Then, 1.25 as a fraction is the same as ■. Since ■ of 8 is 8, and ■ of 8 is 2, the estimate is 8 + 2, or 10."

23. Ali's classmate, Ahmed, estimates for 0.82 × 0.302 as follows:

"0.82 × 0.302 is very close to 0.8 × 0.3. But, the result of 0.8 × 0.3 is related to 8 × 3, which is 24. Since each of 0.8 and 0.3 has only one decimal place, so will their product. The result of 0.8 × 0.3 should be about 2.4."

Ali immediately said:

"This can't be true. Since both 0.82 and 0.302 are less than 1, their product must also be less than 1. It can't be 2.4!

Who is right? Where did the other person make his mistake?

24. Suppose you estimate the product 0.153 × 3.4.

a. Is the result greater than 0.153 or less than 0.153? Why?

b. Is the result greater than 3.4 or less than 3.4? Why?

25. Suppose you estimate the product 57.132×0.682.

a. Is the result greater than 57.132 or less than 57.132? Why?

b. Is the result greater than 0.682 or less than 0.682? Why?

26. Suppose you estimate the product 0.372×0.134.

a. Is the result greater than 0.372 or less than 0.372? Why?

b. Is the result greater than 0.134 or less than 0.134? Why?

27. Use the number sentence $78 \times 12 = 936$ to find each product.

a. 7.8×1.2

b. 7.8×0.12

c. 7.8×0.012

d. 0.78×1.2

e. 0.078×1.2

f. 0.0078×1.2

28. Use the number sentence $145 \times 326 = 47{,}270$ to help you solve the following problems.

a. $1.45 \times 32.6 =$ ■

b. $0.326 \times 1{,}450 =$ ■

c. ■ $\times 32.6 = 472.7$

d. $0.0145 \times$ ■ $= 47.27$

29. Use the number sentence $35 \times 123 = 4{,}305$ to help you solve the following problems.

a. $3.5 \times 123 =$ ■

b. $0.35 \times 123 =$ ■

c. $1.23 \times 0.35 =$ ■

d. $3.5 \times$ ■ $= 43.05$

e. ■ $\times 12.3 = 4.305$

f. $3.5 \times 1.23 =$ ■

30. Explain how the number of decimal places in the factors of a decimal multiplication problem relates to the number of decimal places in the product.

31. Explain how you can find the product of 2.7×4.63 if your calculator screen is damaged and does not display numbers with decimals in them.

32. Find each product.

a. 1.32×10

b. 1.32×100

c. $1.32 \times 1{,}000$

d. $1.32 \times 10{,}000$

e. 12.45×10

f. 12.45×100

g. $12.45 \times 1{,}000$

h. $12.45 \times 10{,}000$

33. Ten-year-old Chi learned a lot of math from his older brother, Shing. One day, Shing tells him that when you multiply a number by 10, "you just add a zero."

a. With Shing's idea in his mind, Chi says, "To find 10×20, I just add a zero. So, $20 + 0 = 20$." How would you correct him?

b. After Chi realizes that "adding zero" actually means "putting an extra zero at the end," he says,

"10×0.02 equals 0.020 by putting the extra zero at the end."

Is he right this time? How would you rephrase "putting an extra zero at the end" in case the other number is a decimal number? Explain why your suggestion works.

c. How can you find the result of multiplying by 100; 1,000; or 10,000 using a similar strategy?

Connections

Multiply.

34. $\frac{7}{3} \times \frac{4}{9}$

35. $\frac{2}{5} \times 15$

36. $3 \times \frac{4}{9}$

37. $2\frac{2}{3} \times \frac{1}{2}$

38. $4 \times 2\frac{2}{3}$

39. $1\frac{1}{2} \times 2.3$

40. Midge wants to buy a carpet for her new room. She finds three carpets that she likes, but they are different sizes and have different prices. She writes down the information about their sizes and prices so that she can decide at home.

Carpet Comparison

Carpet	Length (m)	Width (m)	Price (per m^2)
A	5.09	4.32	$15.89
B	5.86	3.85	$13.85
C	5.95	3.75	$14.59

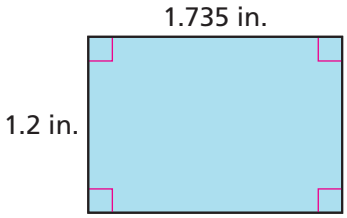
a. Which carpet is the longest?

b. Which carpet has the greatest area?

c. What is the total cost of each carpet? Which carpet costs the most? Which carpet costs the least?

Find the area of each shape.

41.



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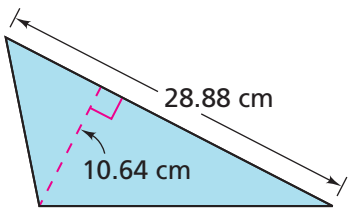

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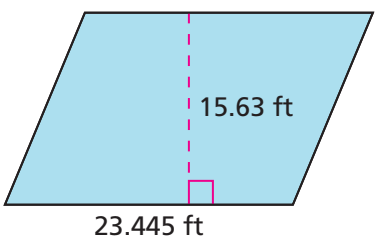

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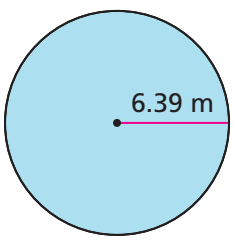

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Web Code: ame-6241

45. Find a length and a width for a rectangle with each given area.

a. 56 ft^2 **b.** 5.6 ft^2 **c.** 0.56 ft^2

Extensions

Find the products.

46. $1.2 \times \frac{31}{40}$ **47.** $0.45 \times 1.7 \times 0.34$ **48.** $0.14 \times 74.3 \times 2.125$

49. **a.** Write a fraction equivalent to $\frac{3.7}{23}$ without decimals.

b. Write a fraction equivalent to $\frac{1.6}{4}$ without decimals.

c. Use your equivalent fractions from parts (a) and (b) to find the product of $\frac{3.7}{23} \times \frac{1.6}{4}$.

50. Fill in the blanks and put a decimal point where needed to make the calculation complete.

$$\begin{array}{r} 152\square \\ \times \quad \square.9 \\ \hline 1371\square \\ +\ 3\square 48 \\ \hline 4\square.196 \end{array}$$

51. Tanisha and Belinda found estimates for the product of 5.2×100.4 in two different ways:

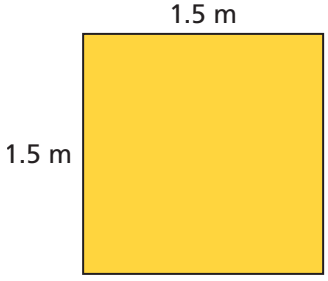
Tanisha said: "I round 5.2 to 5. I multiply 5×100.4 because I know that 5×0.4 is 2. So, my estimation is $500 + 2$, or 502."

Belinda said: "I prefer to round 100.4 to 100 and find 5.2×100 instead. Moving the decimal point two places to the right, I find the estimation as 520."

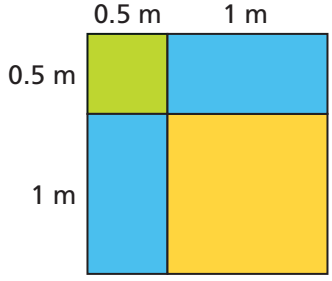
Without finding the exact result of 5.2×100.4, can you tell whose estimation is closer to the exact answer?

52. Explain why you do not have to align the decimal points when multiplying two decimal numbers.

53. **a.** Find the area of the square.

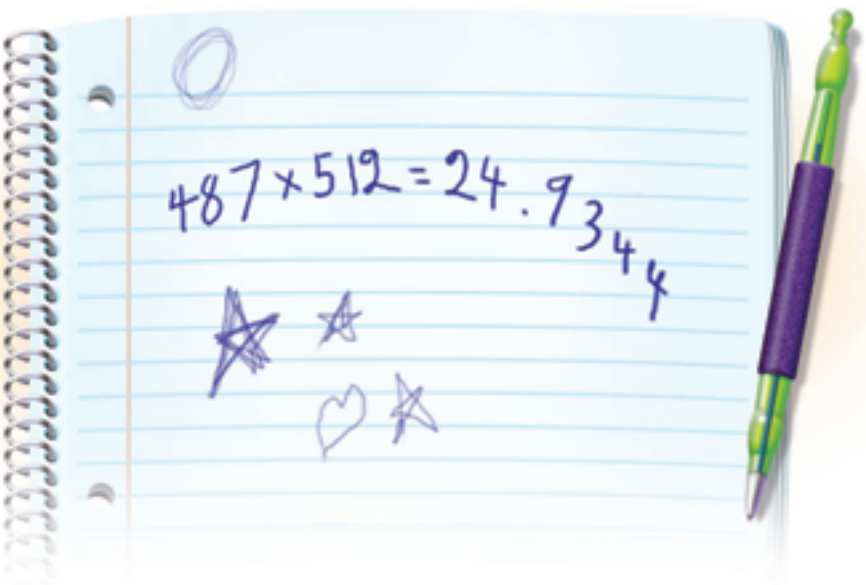


b. Find the area of each piece within the larger square.



c. Explain how the values you obtained in part (b) are related to your answer to part (a).

54. This morning, Janet was feeling very sleepy toward the end of class when her teacher multiplied two decimal numbers and got 24.9344. Later, when Janet looked at her notebook, she realized that she forgot to put the decimal points of the two numbers in her notebook. Here is what she had written:



a. Where do you think the decimal points should be in the factors?

b. Is there more than one possibility? Explain.

55. On some television game shows, players can lose points for wrong answers. For example, if a player starts with 0 points and gets a 100-point question wrong, he or she has −100 (read as "negative one hundred") points.

a. Suppose a player starts with 0 points and gets three 50-point questions wrong. What is the score?

b. Suppose a player starts with 50 points and gets three 100-point questions wrong. What is the score?

c. Suppose a player starts with 0 points, then gets a 100-point question right and a 200-point question wrong. How many points does this player need to get back to 0 points?

d. A player has 150 points by getting one question right and one question wrong. What are the possible point values of these questions?