3.1

Solving Problems with Fractions

Try These

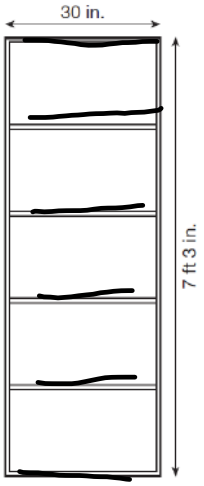
i) $1 \div \frac{7}{8} =$ $\frac{1}{1} \times \frac{8}{7} = \frac{8}{7}$

ii) $\frac{3}{8} + \frac{1}{16} =$ $\frac{6}{16} + \frac{1}{16} = \frac{7}{16}$

iii) $\frac{3}{4} \div \frac{1}{8} =$ $\frac{3}{4} \times \frac{8}{1} = \frac{24}{4} = 6$

iv) $\frac{1}{4} \times \frac{7}{8} =$ $\frac{7}{32}$

Katie is a cabinetmaker. A client wants her to build this cabinet with equally spaced shelves. She plans to use $\frac{3}{4}$ in. birch plywood. How far apart are the shelves from the bottom of the shelf to the top of the next?



1. How many boards will Katie need to build the top, the bottom, and the shelves? 6 boards

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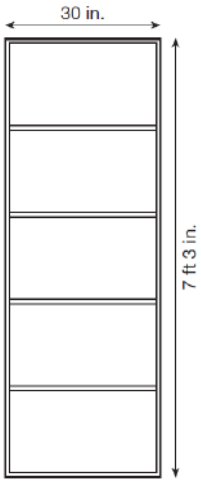

2. If each board is $\frac{3}{4}$ in. thick, what is the total thickness of these boards?

6 × $\frac{3}{4}$ in. = $\frac{18}{4}$ in. = $\frac{9}{2}$

$\frac{6}{1} \times \frac{3}{4} =$

= $4\frac{1}{2}$ in.

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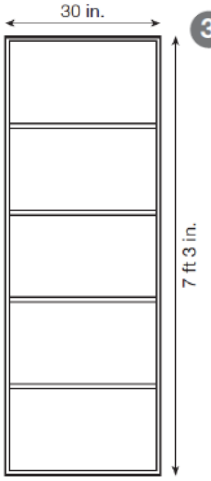

3 How much of the cabinet height is left for the space between the boards?

7 ft 3 in. – 4 1/2 in. =

7 × 12 = 84 + 3

87 − 4 1/2

= 82 1/2 inches

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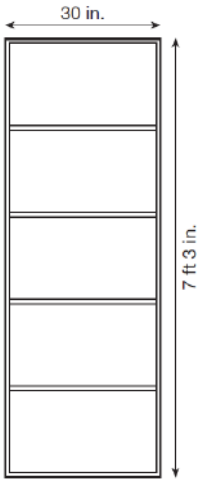

4 How many spaces are there between the boards?

5

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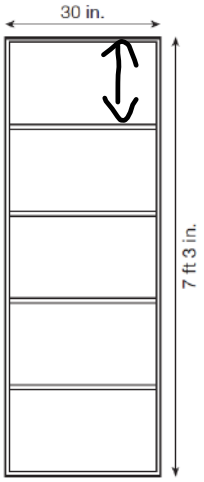

5 How far apart should Katie put the shelves?

$82\frac{1}{2} \div 5$

$\frac{165}{2} \div 5$

$\frac{165}{2} \times \frac{1}{5} = \frac{165}{10} = 16\frac{1}{2}$

Katie should put the shelves $16\frac{1}{2}$ in. apart.

Example 1

Caden is a baker. He cuts a $14\frac{1}{2}$ in. roll of dough into $1\frac{1}{4}$ in. slices for cinnamon buns. How many buns can he make from one roll?

A. What equation can you use to solve this problem?

Number of buns = $14\frac{1}{2}$ ÷ $1\frac{1}{4}$

B. Rewrite the equation using improper fractions.

Number of buns = $\frac{29}{2} \div \frac{5}{4}$

C. How many buns can Caden make from one roll?

$\frac{29}{2} \times \frac{4}{5} = \frac{116}{10} = 11\frac{6}{10}$

$= 11\frac{3}{5}$

Caden can make 11 whole buns and $\frac{3}{5}$ of another bun.

Example 2

A jack raises a car $\frac{3}{16}$ in. for each stroke of the lever. How many strokes are needed to raise a car $1\frac{1}{2}$ in.?

A. Write $1\frac{1}{2}$ in. using a denominator of 16.

Mixed number: $1\ \frac{8}{16}$ in. Improper fraction: $\frac{24}{16}$ in.

B. How many strokes of $\frac{3}{16}$ in. are needed to reach $\frac{24}{16}$ in.?

$\frac{24}{16} \div \frac{3}{16} = \frac{24}{16} \times \frac{16}{3} = \frac{384}{48} = 8$ $\frac{24}{3}$

8 strokes are needed to raise the car $1\frac{1}{2}$ in.

C. How can you use multiplication to check your answer?

$\frac{8}{1} \times \frac{3}{16} \stackrel{?}{=} \frac{24}{16} = 1\frac{1}{2}$