Ratio Route

Write proportions to find missing values.

7.CE.2.b · Write and solve a proportion that represents a proportional relationship between two quantities to find a missing value, including problems in context.

Name _____ Date _____

EQUAL RATIOS

In a proportional relationship, two matching ratios are equal. Keep the quantities in the same order in both fractions, then cross multiply and solve for x.

Worked example

A printer makes 4 posters in 7 minutes. At the same rate, how many posters can it make in 21 minutes?

1. Write a proportion: 4/7 = x/21.
2. Cross multiply: 4 x 21 = 7x.
3. Multiply: 84 = 7x.
4. Divide by 7: x = 12.

12 posters

1. Practice

3 notebooks cost $5. At the same rate, 30 notebooks cost $x. Write and solve a proportion.

2. Practice

A game gives 9 points for 24 coins. How many points does it give for 16 coins? Write and solve a proportion.

3. Practice

8 tickets cost $11. How much do 40 tickets cost? Write and solve a proportion.

4. Practice

14 smoothies use 18 cups of yogurt. At the same rate, how many smoothies use 36 cups of yogurt? Write and solve a proportion.

5. Practice

A machine packs 6 boxes in 15 minutes. At the same rate, how many boxes can it pack in 35 minutes? Write and solve a proportion.

6. Practice

A paint mix uses 5 blue drops for every 9 white drops. If 25 blue drops are used, how many white drops are needed? Write and solve a proportion.

7. Apply

A music app downloads 18 songs in 3 minutes at a steady rate. How many songs will it download in 8 minutes? Write and solve a proportion.

8. Apply

A club prints 15 stickers for $6. At the same cost per sticker, how much will 35 stickers cost? Write and solve a proportion.

9. Challenge

A theater sells 15 student tickets for $18. A club has $75 and must buy whole tickets. At the same price per ticket, what is the greatest number of tickets the club can buy, and how much money will be left? Write and solve a proportion.

What to accept

Accept equivalent proportions when matching quantities stay in the same order. For the challenge, accept 62.5 as the proportional result, but the final answer must be 62 whole tickets and $0.60 left.

1. Practice

3/5 = 30/x; x = 50

2. Practice

9/24 = x/16; 6 points

3. Practice

8/11 = 40/x; $55

4. Practice

14/18 = x/36; 28 smoothies

5. Practice

6/15 = x/35; 14 boxes

6. Practice

5/9 = 25/x; 45 white drops

7. Apply

48 songs

Use 18/3 = x/8. Cross multiply to get 3x = 144, so x = 48.

8. Apply

$14

Use 15/6 = 35/x. Cross multiply to get 15x = 210, so x = 14.

9. Challenge

62 tickets, with $0.60 left Use 15/18 = x/75, giving x = 62.5 before the whole-ticket constraint. Buy 62 for $74.40.