In a Rectivide puzzle, the goal is to divide a single rectangle into three smaller rectangles so that each small rectangle has the same ratio of gray squares to white squares as the original rectangle.

**EXAMPLE**  Solve the Rectivide puzzle below.

![Rectivide puzzle](image)

The ratio of gray squares to white squares in the original rectangle is $4:8 = 1:2$. So, we can make groups of 3 squares in each of the smaller rectangles, with 1 gray and 2 white squares. Therefore, the area of each small rectangle is a multiple of 3.

We can split the rectangle into three smaller rectangles as shown below so that the ratio of gray squares to white squares is 1:2 in each smaller rectangle.

![Solution](image)

This is the only solution.

**PRACTICE**  Solve each Rectivide puzzle below.

43. ![Rectivide puzzle](image)
44. ![Rectivide puzzle](image)
45. ![Rectivide puzzle](image)
46. ![Rectivide puzzle](image)
PRACTICE

Solve each Rectivide puzzle below.

47. [Rectivide puzzle image]

48. [Rectivide puzzle image]

49. [Rectivide puzzle image]

50. [Rectivide puzzle image]

51. [Rectivide puzzle image]

52. [Rectivide puzzle image]

53. [Rectivide puzzle image]

54. [Rectivide puzzle image]
We often use fractions when working with ratios. For example, a boy:girl ratio of 2:3 can be written as \(\frac{\text{boys}}{\text{girls}} = \frac{2}{3}\).

This means that the number of boys divided by the number of girls equals \(\frac{2}{3}\).

A proportion is an equation showing that two ratios are equal. There are many ways to find the missing value in a proportion.

To solve for \(x\) in the proportion \(4:7 = x:21\), we can solve for \(x\) in the equation \(\frac{4}{7} = \frac{x}{21}\).

**EXAMPLE**

What is the value of \(x\) in the equation below?

\[
\frac{4}{7} = \frac{x}{21}
\]

We can convert the fraction.

We can write \(\frac{4}{7}\) with a denominator of 21 by multiplying the numerator and denominator by 3.

\[
\frac{4}{7} = \frac{12}{21}, \text{ so } x = 12.
\]

--- or ---

We can isolate the variable.

To isolate the variable \(x\), we multiply both sides of the equation by 21.

\[
\frac{4}{7} \cdot 21 = \frac{x}{21} \cdot 21
\]

On the left side, we get \(4 \cdot 3 = 12\). So, \(x = 12\).

--- or ---

\[
\frac{4}{7} \cdot 21 = \frac{x}{21} \cdot 21
\]

\[
12 = x
\]

**PRACTICE**

Fill in the missing value in each equation below.

55. \(\frac{2}{3} = \frac{15}{\_}\)  
56. \(\frac{15}{\_} = \frac{5}{12}\)  
57. \(\frac{\_}{32} = \frac{7}{8}\)  
58. \(\frac{19}{11} = \frac{\_}{88}\)

**PRACTICE**

Solve for the variable in each equation below.

59. \(\frac{3}{7} = \frac{x}{42}\)  
60. \(\frac{13}{9} = \frac{a}{45}\)  
61. \(\frac{w}{35} = \frac{21}{15}\)  
62. \(\frac{m}{21} = \frac{9}{4}\)
**EXAMPLE**

What is the value of \( x \) in the equation below?

\[
\frac{5}{9} = \frac{8}{x}
\]

We can eliminate the denominators.

We eliminate the denominators of \( \frac{5}{9} \) and \( \frac{8}{x} \) by multiplying both sides of the equation by a common multiple of their denominators: \( 9x \).

This gives \( 5x = 72 \).

We divide both sides by 5 to get \( x = \frac{72}{5} = 14 \frac{2}{5} \).

For any equation \( \frac{a}{b} = \frac{c}{d} \), we have \( ad = bc \).

**PRACTICE**

Solve for the variable in each equation below. Write your answer in simplest form.

63. \( \frac{2}{3} = \frac{15}{m} \)

64. \( \frac{12}{s} = \frac{5}{8} \)

66. \( \frac{14}{a} = \frac{4}{9} \)

65. \( \frac{7}{4} = \frac{15}{c} \)

66. \( a = \) ______

67. \( \frac{2}{5} = \frac{15}{z} \)

68. \( \frac{3}{10} = \frac{10}{v} \)

67. \( z = \) ______

69. \( \frac{8}{n} = \frac{11}{6} \)

70. \( \frac{10}{7} = \frac{6}{r} \)

69. \( n = \) ______

70. \( r = \) ______