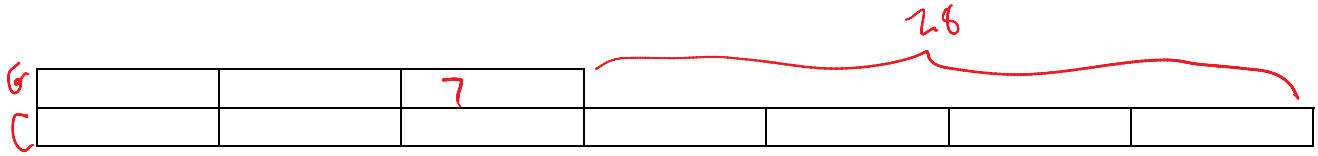
**Expressing ratios in different ways:**

1. Starting from the ratio information, the ratio of hardback to paperback books on my bookshelf is 3:5, express this same relationship in several ways, by filling each blank with a number:
a. There are __3/5__ as many hardback as paperback books on my shelf
b. __3/8__ of the books on my shelf are hardback books.
c. __37.5__ % of the books on my shelf are hardback books.

2. Halloween M&Ms come in two colors: black and orange. Starting from the information: 4/9 of the M&Ms are orange, express this same relationship in several ways, by filling each blank with a number:
a. The ratio of black to orange M&Ms is _5_:_4_
b. There are __4/5__ as many orange M&Ms as black ones.

**Solving problems with ratios.** Make sure to use a representation that shows how to find the solution. Use bar diagrams and tables as appropriate to organize and explain your work.

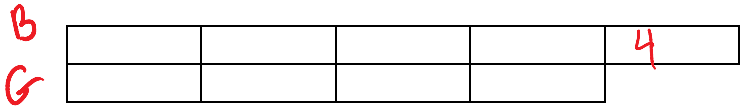
3. The ratio of kinds of gum to kinds of candy in the candy store is 3:7. If there are 28 more kinds of candy than gum, how many kinds of gum are there?




□ = 28 ÷ 4 = 7

Gum = 3 × 7 = 21 kinds of gum.

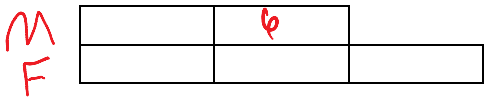
4. The ratio of boys to girls in a class is 5:4. If there are 36 children in the class, how many of them are boys?




> 36 □ = 36 ÷ 9 = 4

Boys = 4 × 5 = 20 boys

5. There are 2/3 as many male teachers as female teachers in a school. If there are 30 teachers altogether, how many more female teachers than male teachers are there?




> 30 □ = 30 ÷ 5 = 6

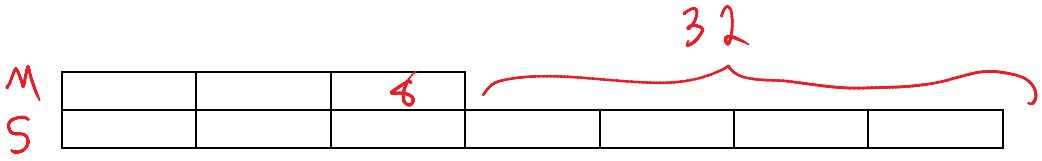
M = 2 × 6 = 12

F = 3 × 6 = 18

18 - 12 = 6

There are 6 more F than M teachers.

6. Mary has 3/7 as many stickers as Susan. Susan has 32 more stickers than Mary. If Susan gives 1/4 of her stickers to Mary, what will be the new ratio of Mary's stickers to Susan's?




□ = 32 ÷ 4 = 8
M has 3 × 8 = 24
S has 7 × 8 = 56

| | Mary's stickers | Susan's stickers | M:S |
|---|---|---|---|
| now | 24 | 56 | 3:7 |
| later | 38 | 42 | 38 : 42 = 19 : 21 |

×14 ×14 −14 −14

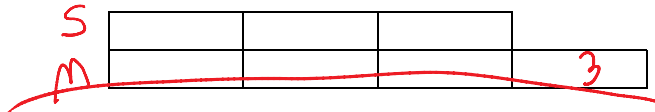
1/4 of S = 1/4 · 56 = 56 ÷ 4 = 14
56 − 14 = 42 24 + 14 = 38

New ratio
19 : 21
M : S

7. Sarah cat weighs 3/4 as much as Mimi cat. If they each lost 1 lb, they would weigh 19 lbs together. How much does each cat weigh?

| | Sarah | Mimi | S:M | Together |
|---|---|---|---|---|
| Now | | | 3:4 | |
| Later | | | | 19 |

−1 −1 −2 ×7

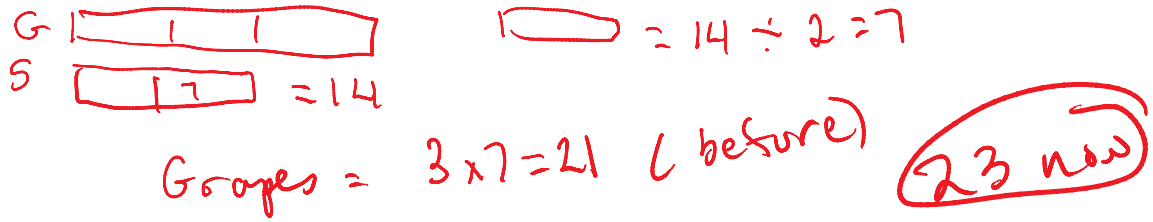



> 21 □ = 21 ÷ 7 = 3

S weighs □ × 3 = 9 lbs
M weighs □ × 4 = 12 lbs.

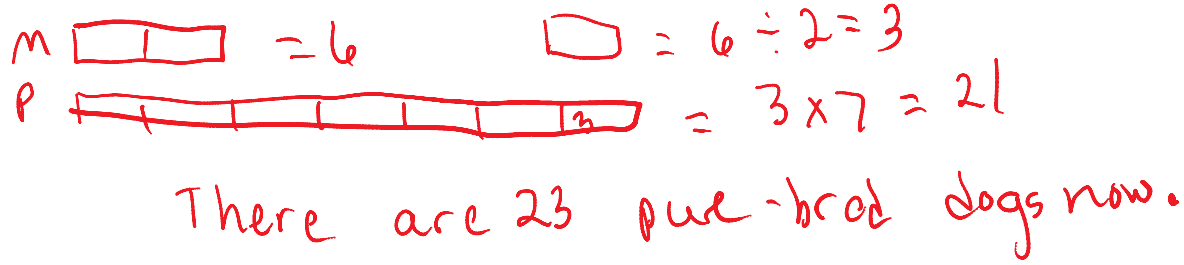
8. The ratio grapes to strawberries in the bowl of fruit started at a ratio of 3:2. I added 2 strawberries and 2 grapes. There are now 16 strawberries. How many grapes are there?

| | grapes | strawberries | ratio G:S |
|---|---|---|---|
| was | 21 ↓+2 | 14 ↓+2 | 3:2 |
| now | 23 | 16 | |




9. At the pet store the ratio of mongrels to pure-breds is two to seven. Two more pure-bred dogs and two more mongrels are brought in. If there are 8 mongrels <u>after</u> the new dogs arrive, how many dogs are there now?

| | mongrels | pure breds | ratio M:P |
|---|---|---|---|
| was | ↓+2 6 | 21 | 2:7 |
| now | 8 | 23 ↓+2 | |




10. The Widdle Widget company manufactures Widgets and Doodads. One day Joe, who works on the Doodad production line, was sick, and for the first 6 hours of the shift, they made only 2/3 as many Doodads as Widgets. For the last 2 hours, Dan was reassigned to Doodads, and they made equal amounts (25 each) of Doodads and Widgets. If they made 85 Doodads that day, how many Widgets did they make?

| | Doodads | Widgets | ratio D:W |
|---|---|---|---|
| first 6 hours | 60 ↓+25 | 90 ↓+25 | 2:3 |
| total (end of 8 hrs) | 85 | 115 | |