

RATIO & PROPORTION PRACTICE

1. Widescreen televisions have an aspect ratio of 16:9. For every 16 units of width, there are 9 units of height.

- a) If the screen on the left is 50 inches wide, how tall is it?
- b) If the screen on the right is 50 inches tall, how wide is it?



2. a) A rectangle has a width:height ratio of 3:2. It's 612 cm wide, how tall is it?
b) A rectangle has a width:height ratio of 3:2. It's 612 cm tall, how wide is it?

3. Imagine that you are at a grocery store that lets you pull products apart and pay for as much or as little of them as you want.

- a) At the store, a dozen eggs (12 eggs) cost \$4.55, but you only want to buy 5 eggs. What would your grocery bill be for 5 eggs?
- b) At the store, a 6-pack of sparkling water cost \$7.00, but you only want to buy 4 sparkling waters. What would your grocery bill be for 4 sparkling waters?

RATIO & PROPORTION PRACTICE

4. Here are some mild proportional reasoning problems:

- a) Davey drove 160 miles in 3 hours. If she continued at the same rate, how far would she travel in 5 hours?
- b) 2 cups of flour are needed to make 20 cookies. How many cups of flour are needed to make 110 cookies?
- c) A water pump that can fill a 750-gallon tank in 35 minutes. How long will it take this same water pump to fill a 1000-gallon tank?
- d) You are making a scale drawing of a house and the peak of the roof is 24ft. The scale of the drawing is 2 cm represents 5 ft in reality. How many centimeters tall will your drawing be?

5. **The Earth and the Moon:** Let's assume we are trying to build a scale model of the earth and moon. We want the earth to be 10 cm in diameter. What would be the diameter of our model of the moon, and how far away would it need to be from our model of the earth?

Necessary Information	Possibly helpful unit conversions
Earth diameter: 7,926 miles Moon diameter: 2,159.1 miles Distance from moon to earth: 238,900 miles	1 miles = 5280 ft 1 ft = 30.48 cm Online unit converter

6. **Planet Scale Model:** Using a model of the sun that is 10 feet in diameter. If we are making a scale model of our solar system, what would the diameter of the scale model of the earth be? And how far away from the model sun would our model earth be? What about Neptune?

Necessary Information	Possibly helpful unit conversions
Sun diameter: Earth diameter: 7,926 miles Neptune diameter: Distance from sun to Earth: 91,778,000 miles Distance from sun to Neptune: 2,779,000,000 miles	1 miles = 5280 ft 1 ft = 30.48 cm Online unit converter

RATIO & PROPORTION PRACTICE

7. Old shows on new televisions

I used to spend a lot of time at my Grandma's house and we always watched the greatest comedy show ever made: The Golden Girls. Now this was the 1980s, and tv's were more square back then. All tvs had an aspect ratio of 4:3 (4 units wide for every 3 units tall)

Fast forward to today and there are no more 4:3 televisions, and the industry standard is now 16:9 (they are 16 units tall for every 9 units wide). Since old and new televisions are not geometrically similar, broadcasting old shows on new television presents a few tradeoffs. Television stations have a few options:

Option 1: Fit the tv show horizontally, and then vertically squish it to fit on the screen. It's great that you can see the entire show, but the image looks distorted and I don't think Bea Arthur wants to look squished.

Option 2: Enlarge the show so that it is wide enough to fit the entire widescreen and crop out whatever doesn't fit. It's great that now the show is not distorted, but you don't get to see everything in the original broadcast.

Option 3: Vertically fit the screen, and leave a blank screen on either side of the show. This is the option that tv shows select because it preserves the original look of the show. The problem with this solution is that you don't get to use all the screen area on your television. Let's try to see how bad this problem really is:

Using option 3: What percent of the screen area is unused when a 4:3 tv show is played on a 16:9 screen?



Golden Girls on grandma's tv in the 1980s



Option 1: Distorted image



Option 2: Cropped image



Option 3: Preserved image, some screen area unused