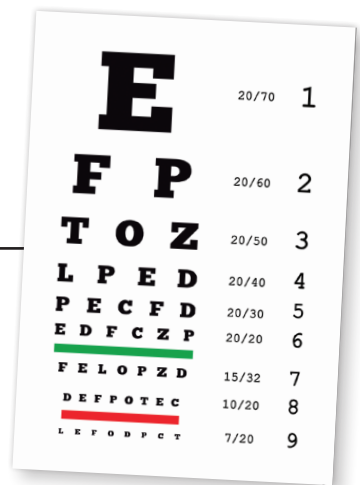


EYEING THE MATH

Opticians are also mathematicians! Check out some math vocabulary and special tools that opticians work with every day as you solve the real-world situations below. Write the answers in the space provided.



PART 1: SNELLEN CHART OPTICAL TOOL

Created by Dutch ophthalmologist Dr. Hermann Snellen in 1862, this chart measures visual acuity (clarity of vision), based on how well you can see from 20 feet away without glasses compared to what someone else with normal vision would see. Normal vision is 20/20.

The first number represents your distance in feet from the chart. The second number is the distance from which someone else with normal vision can read the same line. Results are based on the smallest line of letters you can identify without glasses. The larger the second number, the weaker the eyesight.

1. A patient's vision changes from 20/20 to 20/40. This means they have to be twice as close to an object as a person with normal vision in order to see it clearly. If a person with uncorrected vision can see the chart from 40 feet away, how far away can the patient with 20/40 vision see it clearly? _____
2. You have 20/20 vision and your friend has 20/40 vision. If your friend can read the movie theater sign from 18 feet away, how far can you read it? _____
3. Another friend has 20/60 vision and can read a scoreboard sign from 129 feet away. How far away can you read the scoreboard? _____

PART 2: LENSOMETER OPTICAL TOOL

Opticians use a Lensometer to check the accuracy of a corrective eyewear prescription by measuring lens focus power in units called *diopters*. Negative diopter measurement indicates nearsightedness (you see well up close but not at a distance), while positive diopter measurement indicates farsightedness (you see well from a distance but not up close).

1. An optician dispenses contact lenses and must understand numbers featured in lens prescriptions. For example: One lens has a power of +1.75 diopters, and the other has a power of -0.50 diopters. What is the difference in diopters between the two lenses? _____
2. A student is nearsighted. Their current corrective eyewear prescription for the left eye is -2.5 diopters. The optometrist prescribes a new lens of -3.25 diopters. By how much did the prescription increase in strength? _____ diopters
3. An optician is testing the power of two different lenses. Lens power is measured in diopters (D) by dividing 1 by the lens focal length measured in meters: $P = 1 \div f$. Which of the lenses has more optical power? Write a greater than (>) or less than (<) symbol to show your answer.

Lens A: focal length 0.25 meters _____ Lens B: focal length 0.5 meters

What is the difference in power between the two? _____ diopters

Did you know? Millimeters are used to measure eyeglass frames including *lens width*, *bridge width* (distance between the lenses where eyeglasses balance on the nose), and *temple length* (distance from the lens to the back of the ear, the "arm"). Here are sample measurements: child: 39 15 120; adult: 50 18 150.

OPTICIAN CAREER SPOTLIGHT

"Math is woven into every aspect of vision care and everyday life as an optician. It wasn't always my strength, but vision math is different — it's practical and makes sense. The numbers directly translate into meeting your patient's visual needs."

— Rachel Hill, Optician and Owner, Personal Optical

