

◦ ✧ Finals Round ✧ ◦

30 minutes

Please put all answers on the provided answer sheet, units are not required

1. Captain Picard is preparing a speech for a conference. His speech must last 45 minutes. The ideal rate of speech is 150 words per minute. What is the number of words in Picard's speech, given that he speaks at the ideal rate.
2. When Wall-E was young, he could travel 30 miles in 3 hours and 30 minutes. As an old robot, he can now travel 15 miles in 4 hours. How many minutes longer does it take for him to travel a mile now compared to when he was young?
3. Buzz Lightyear and his 2 other friends order food from a restaurant and find the bill to be \$100.00 (without tax). Then a 5% tax is applied. The three each carry with them \$40.00. How much money do they have leftover that they can tip?
4. An alien company sells fuel in cylindrical jars. Their research suggests using wider jars will increase sales. If the diameter of the jars is increased by 25% without altering the volume, by what percent must the height be decreased?
5. Darth Vader is designing a sleek new uniform. His design includes a rhombus with an area of 64. The longer diagonal is 2 times longer than the shorter diagonal. What is the perimeter of the rhombus?
6. Let S be the greatest 5-digit number whose digits have a product of 120. What is the sum of the digits of S ?
7. Gamora is a very quick runner and can maintain a speed of 14mph. Gamora and Nebula race from a city to their spaceship. Gamora runs along the road and goes 3 miles east, then 4 miles south. Nebula is slower and can only go 10 mph, but she knows a shortcut through the woods that will take her directly from the city to the ship. If they both leave at the same time, who will get there first?
8. Starfleet is designing new uniforms with different paint colors. A mixture of 30 liters of paint is 25% red tint, 30% yellow tint and 45% water. Five liters of yellow tint are added to the original mixture. What is the percent of yellow tint in the new mixture?

(Flip to Back)

9. The starship Enterprise is conducting a survey of organisms on a planet. A lake contains 250 bacteria, along with a variety of ameobas. When the science officer observes a sample of 180 organisms from the lake, 30 are identified as bacteria. Assume the ratio of bacteria to the total number of organisms is the same as in both the sample and the lake. How many ameobas are in the lake?

10. Darth Vader is planning to redecorate his room, as such, he is trying to find the area of his floor plan. His floor plan is an enclosed space $USRT$, where \overline{US} and \overline{UT} are line segments each of length 2, and $m\angle TUS = 60^\circ$. Arcs \widehat{TR} and \widehat{SR} are each one-sixth of a circle with radius 2. What is the area of his floor?

