

Assignment: Operations with Radical Expressions

Choose any four of the following five problems to solve. Use the appropriate operation with radical expressions to solve each problem. Write all answers in simplest form, and show all work leading to your answer.

1. Two passengers on a cruise ship look out across the horizon. One of the passengers who is standing on the upper deck can see a distance of $\sqrt{48}$ miles. The other passenger who is standing on the lower deck can see a distance of $\sqrt{27}$ miles.
 - a. Write an expression to represent the difference between the two distances each passenger can see. Then simplify the expression, keeping your answer in radical form. Show all steps needed to write your answer in simplest form.
 - b. Use a calculator to change the answer to decimal form. Round the answer to the nearest tenth. Using this decimal number, write a sentence to explain the meaning of the answer in this situation.

2. A research scientist uses radar to track the migration of various types of birds. She estimates that a certain flock of geese traveled a distance of $\sqrt{750}$ on one day and $\sqrt{1080}$ miles the next day.
 - a. Write an expression to represent the total distance covered by the geese over the two day period. Then simplify the expression, keeping your answer in radical form. Show all steps needed to write your answer in simplest form.
 - b. Use a calculator to change the answer to decimal form. Round the answer to the nearest tenth. Using this decimal number, write a sentence to explain the meaning of the answer in this situation.

3. Before embarking on a flight, the pilot of a private airplane plans the best route to the final destination. Suppose the pilot determines one route covers a distance of $\sqrt{500}$ miles and another covers a distance of $\sqrt{605}$ miles.
 - a. Write an expression to represent the difference between the two distances of each route. Then simplify the expression, keeping your answer in radical form. Show all steps needed to write your answer in simplest form.
 - b. Use a calculator to change the answer to decimal form. Round the answer to the nearest tenth. Using this decimal number, write a sentence to explain the meaning of the answer in this situation.

4. An engineer in a computer manufacturing company is trying to determine the best way to align two circuit boards in a new laptop computer. Suppose one of the circuit boards has a diagonal measurement of $\sqrt{24}$ centimeters and the other has a diagonal measurement of $\sqrt{54}$ centimeters.
 - a. Write an expression to represent the total length across the diagonals of both circuit boards. Then simplify the expression, keeping your answer in radical form. Show all steps needed to write your answer in simplest form.
 - b. Use a calculator to change the answer to decimal form. Round the answer to the nearest tenth. Using this decimal number, write a sentence to explain the meaning of the answer in this situation.

5. Two students measure their reaction times by seeing how many seconds it takes one of them to catch a yard stick that the other drops right above his hand. Suppose the radical $\sqrt{0.08}$ represents the time it takes one of the students to catch the ruler, and $\sqrt{0.18}$ represents the time it takes the other student to catch it.
- Write an expression to represent the difference between the two reaction times. Then simplify the expression, keeping your answer in radical form. Show all steps needed to write your answer in simplest form.
 - Use a calculator to change the answer to decimal form. Round the answer to the nearest tenth. Using this decimal number, write a sentence to explain the meaning of the answer in this situation.