

Chapter 5 Test

Multiple Choice

For #1 to 5, select the best answer.

- Which mixed radical is equal to $\sqrt{486a^4b}$ in simplest form?
 A $3a^2\sqrt{54b}$ B $9a^2\sqrt{6b}$
 C $2ab\sqrt{86}$ D $2ab\sqrt{243}$
- Which expression represents $5ab^2\sqrt{5}$ written as an entire radical?
 A $ab^2\sqrt{25}$ B $\sqrt{25a^2b^3}$
 C $\sqrt{125ab^2}$ D $\sqrt{125a^2b^4}$
- What is the sum of $\sqrt{50} - \sqrt{18} + \sqrt{8}$?
 A $4\sqrt{2}$ B $2\sqrt{10}$
 C $1\sqrt{40}$ D $10\sqrt{2}$
- Which expression represents $(5 + \sqrt{2})^2$ when it is expanded and written in simplest form?
 A 27 B 29
 C $27 + 10\sqrt{2}$ D $37\sqrt{2}$
- Fran and Jaspreet rationalize the denominator of a radical expression. They record their partial solutions.

Fran $\frac{\sqrt{18}}{\sqrt{3}}$ Step 1 $= \frac{\sqrt{18}}{3}$ Step 2 $= \sqrt{6}$ Step 3	Jaspreet $\frac{3}{\sqrt{6}}$ Step 1 $= \left(\frac{3}{\sqrt{6}}\right)(\sqrt{6})$ Step 2 $= 3$ Step 3
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Which student made an error, and in which step?

- Fran made an error in step 2.
- Jaspreet made an error in step 2.
- Fran made an error in step 3.
- Jaspreet made an error in step 3.

Short Answer

- Arrange the numbers 9, $5\sqrt{3}$, $4\sqrt{5}$, $2\sqrt{19}$, and $6\sqrt{2}$ in order from least to greatest.
 - Determine algebraically whether the statement $\sqrt{16} + \sqrt{9} = 5$ is true or false.
 - The area of a rectangle is 42 square units and its width is $\sqrt{6}$ units. What is the exact length of the rectangle in simplest form?
 - What is the expression $2\sqrt{3} - (\sqrt{5} + \sqrt{12} - 2\sqrt{45})$ in simplest form?
 - Solve $\sqrt{r+15} = \sqrt{3r+1}$ algebraically. State any restrictions on the values for the variable.
 - What is the quotient of $\frac{4+\sqrt{5}}{2-\sqrt{5}}$ in simplest form?
- ### Extended Response
- The velocity, v , in metres per second, of a roller coaster at the bottom of a hill is related to the vertical drop, h , in metres, and the velocity, v_0 , in metres per second, of the roller coaster at the top of the hill by the formula $v_0 = \sqrt{v^2 - 20h}$.
 - Valerie simplifies the expression for the formula to $v_0 = v - 2\sqrt{5h}$. Is Valerie's simplification correct? Explain your reasoning.
 - Suppose the velocity at the top of a hill is 20 m/s and the velocity at the bottom of the hill is 40 m/s. What is the vertical drop of the hill?
 - Isolate the x -variable in the radical equation, $4 + \sqrt{4 + x^2} = x$.
 - Verify by substitution whether the value determined for x is a root of the equation.
 - Determine the roots of the equation $\sqrt{5y+1} - \sqrt{3y-5} = 2$ algebraically.
 - Identify any restrictions on the values for the variable.

