

Direction: Write neatly; show your work in an organized fashion.

1. Is $\sqrt{15}$ rational or irrational?	2. Simplify $\sqrt{27x^6}$
3. Simplify $\sqrt{5} \cdot \sqrt{10}$	4. Simplify $\sqrt{3ab} \cdot \sqrt{6ab^3}$
5. Simplify $\frac{\sqrt{35x}}{\sqrt{80xy^2}}$	6. Simplify $\sqrt{8} + 3\sqrt{32}$
7. Simplify $(5 + \sqrt{11})(3 + \sqrt{11})$	8. Simplify $\frac{10}{4 - \sqrt{5}}$
9. Solve the equation: $\sqrt{3x} + 2 = 14$	10. Simplify $\sqrt[3]{-64}$

<p>1. Is $\sqrt{15}$ rational or irrational?</p> <p>Irrational</p>	<p>2. Simplify $\sqrt{27x^6}$</p> $= \sqrt{9x^6} \sqrt{3}$ $= 3x^3 \sqrt{3}$
<p>3. Simplify $\sqrt{5} \cdot \sqrt{10}$</p> $= \sqrt{50}$ $= \sqrt{25} \sqrt{2}$ $= 5\sqrt{2}$	<p>4. Simplify $\sqrt{3ab} \cdot \sqrt{6ab^3}$</p> $= \sqrt{18a^2b^4}$ $= \sqrt{9a^2b^4} \sqrt{2}$ $= 3ab^2 \sqrt{2}$
<p>5. Simplify $\frac{\sqrt{35x}}{\sqrt{80xy^2}}$</p> $= \frac{\sqrt{35x}}{\sqrt{80xy^2}}$ $= \frac{\sqrt{7}}{\sqrt{16y^2}} = \frac{\sqrt{7}}{\sqrt{16y^2}}$ $= \frac{\sqrt{7}}{4y}$	<p>6. Simplify $\sqrt{8} + 3\sqrt{32}$</p> $= \sqrt{4}\sqrt{2} + 3\sqrt{16}\sqrt{2}$ $= 2\sqrt{2} + 3 \cdot 4\sqrt{2}$ $= 2\sqrt{2} + 12\sqrt{2}$ $= 14\sqrt{2}$
<p>7. Simplify $(5 + \sqrt{11})(3 + \sqrt{11})$</p> $= 15 + 5\sqrt{11} + 3\sqrt{11} + \sqrt{121}$ $= 15 + 5\sqrt{11} + 3\sqrt{11} + 11$ $= 26 + 8\sqrt{11}$	<p>8. Simplify $\frac{10}{4 - \sqrt{5}} \left(\frac{4 + \sqrt{5}}{4 + \sqrt{5}} \right)$</p> $= \frac{40 + 10\sqrt{5}}{16 - \sqrt{25}}$ $= \frac{40 + 10\sqrt{5}}{16 - 5}$ $= \frac{40 + 10\sqrt{5}}{11}$
<p>9. Solve the equation:</p> $\sqrt{3x} + 2 = 14$ $\underline{-2 \quad -2}$ $\sqrt{3x} = 12$ $(\sqrt{3x})^2 = (12)^2$ $\underline{3x = 144}$ $\underline{3 \quad 3}$ $x = 48$	<p>10. Simplify $\sqrt[3]{-64}$</p> $= \sqrt[3]{(-4)^3}$ $= -4$