

2.4 Complex Fractions

Solutions

Simplify.	
<p>1. $\frac{1 + \frac{3}{5}}{2 + \frac{1}{5}} = \frac{\left(\frac{1}{1} + \frac{3}{5}\right) \cdot \frac{5}{1}}{\left(\frac{2}{1} + \frac{1}{5}\right) \cdot \frac{5}{1}}$ LCM(1, 5) = 5</p> $= \frac{\frac{1}{1} \cdot \frac{5}{1} + \frac{3}{5} \cdot \frac{5}{1}}{\frac{2}{1} \cdot \frac{5}{1} + \frac{1}{5} \cdot \frac{5}{1}} = \frac{5+3}{10+1} = \boxed{\frac{8}{11}}$	<p>2. $\frac{2 + \frac{3}{8}}{1 + \frac{1}{3}}$</p>
<p>3. $\frac{\frac{1}{a} + \frac{1}{b}}{\frac{1}{ab}} = \frac{\left(\frac{1}{a} + \frac{1}{b}\right) \cdot \frac{ab}{1}}{\left(\frac{1}{ab}\right) \cdot \frac{ab}{1}}$ LCM(a, b) = ab</p> $= \frac{\frac{1}{a} \cdot \frac{ab}{1} + \frac{1}{b} \cdot \frac{ab}{1}}{\frac{1}{ab} \cdot \frac{ab}{1}} = \frac{b+a}{1} = \boxed{a+b}$	<p>4. $\frac{\frac{3}{x} + \frac{3}{y}}{\frac{6}{x^2 y^2}}$</p>
<p>5. $\frac{\frac{1}{y} + 7}{\frac{1}{y} - 5} = \frac{\left(\frac{1}{y} + \frac{7}{1}\right) \cdot \frac{y}{1}}{\left(\frac{1}{y} - \frac{5}{1}\right) \cdot \frac{y}{1}}$ LCM(y, 1) = y</p> $= \frac{\frac{1}{y} \cdot \frac{y}{1} + \frac{7}{1} \cdot \frac{y}{1}}{\frac{1}{y} \cdot \frac{y}{1} - \frac{5}{1} \cdot \frac{y}{1}} = \boxed{\frac{1+7y}{1-5y}}$	<p>6. $\frac{x - \frac{1}{x}}{x + \frac{1}{x}}$</p>
<p>Answers: 1. $\frac{8}{11}$; 3. $a+b$; 5. $\frac{1+7y}{1-5y}$</p>	

<p>Simplify.</p> <p>7. $\frac{\frac{a^2 - b^2}{ab}}{\frac{a - b}{b}} = \frac{\frac{a^2 - b^2}{ab} \cdot \frac{ab}{1}}{\frac{a - b}{b} \cdot \frac{ab}{1}}$</p> <p>$= \frac{\frac{a^2 - b^2}{\cancel{ab}} \cdot \cancel{ab}}{\frac{a - b}{\cancel{b}} \cdot \cancel{ab}} = \frac{a^2 - b^2}{a(a - b)}$</p> <p>$= \frac{(a + b)(\cancel{a - b})}{a(\cancel{a - b})} = \boxed{\frac{a + b}{a}}$</p> <p style="text-align: right;">LCM(ab, b) = ab</p>	<p>8. $\frac{x^2 - 4}{\frac{x + 2}{3x + 6}}$</p> <p>$\frac{x^2 - 4}{x + 2}$</p>
<p>9. $\frac{\frac{1}{x^2} - \frac{1}{y^2}}{\frac{1}{x} - \frac{1}{y}} = \frac{\left(\frac{1}{x^2} - \frac{1}{y^2}\right) \cdot \frac{x^2 y^2}{1}}{\left(\frac{1}{x} - \frac{1}{y}\right) \cdot \frac{x^2 y^2}{1}}$</p> <p>$= \frac{\frac{1}{x^2} \cdot \frac{x^2 y^2}{1} - \frac{1}{y^2} \cdot \frac{x^2 y^2}{1}}{\frac{1}{x} \cdot \frac{x^2 y^2}{1} - \frac{1}{y} \cdot \frac{x^2 y^2}{1}}$</p> <p>$= \frac{\frac{1}{\cancel{x^2}} \cdot \cancel{x^2} y^2 - \frac{1}{\cancel{y^2}} \cdot \cancel{y^2} x^2}{\frac{1}{\cancel{x}} \cdot \cancel{x} \cdot xy^2 - \frac{1}{\cancel{y}} \cdot \cancel{y} \cdot x^2 y}$</p> <p>$= \frac{\frac{1}{\cancel{x^2}} \cdot \cancel{x^2} y^2 - \frac{1}{\cancel{y^2}} \cdot \cancel{y^2} x^2}{\frac{1}{\cancel{x}} \cdot \cancel{x} \cdot xy^2 - \frac{1}{\cancel{y}} \cdot \cancel{y} \cdot x^2 y} = \frac{y^2 - x^2}{xy^2 - x^2 y}$</p> <p>$= \frac{y^2 - x^2}{xy^2 - x^2 y} = \frac{(y - x)(y + x)}{xy(y - x)} = \boxed{\frac{x + y}{xy}}$</p> <p style="text-align: right;">LCM(x^2, y^2, x, y) = $x^2 y^2$</p>	<p>10. $\frac{\frac{a}{b} + \frac{1}{a}}{\frac{b}{a} + \frac{1}{a}}$</p>
<p>Answers: 7. $\frac{a + b}{a}$; 9. $\frac{x + y}{xy}$</p>	