

### Figure 3.3: Understanding Division Involving Zero

<p><b>Case One</b>  <math>0 \div n, n \neq 0</math>            For example, <math>0 \div 3 = a</math>            Rewrite as equivalent multiplication equation and solve:  <math>3 \times a = 0</math>            Since any number multiplied by 0 is 0, <math>a = 0</math>.            So, <math>0 \div 3 = 0</math>.</p>	<p><b>Case Two</b>  <math>n \div 0, n \neq 0</math>            For example, <math>3 \div 0 = a</math>            Rewrite as equivalent multiplication equation and solve:  <math>0 \times a = 3</math>            Since any number multiplied by 0 is 0, there is no value for <math>a</math> that makes this equation true.            So, <math>3 \div 0</math> is undefined.</p>	<p><b>Case Three</b>  <math>0 \div 0, n \neq 0</math>  <math>0 \div 0 = a</math>            Rewrite as equivalent multiplication equation and solve:  <math>0 \times a = 0</math>            Since any number multiplied by 0 is 0, <math>a</math> can be any number! Because there is no unique value of <math>a</math> that makes this true, this quotient is undefined.            So, <math>0 \div 0</math> is undefined.</p>
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