A 5-Minute Tour of Beamer’s Simplest Features

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Outline

A Question from Grade School

A Geometry Proof

More Advanced Features of BEAMER
A Question from Grade School

(Illustrating \texttt{BEAMER}'s \texttt{pause} command.)

A couple of years ago, a fifth-grade teacher asked me to explain to her the reasoning behind the “invert and multiply” rule for dividing fractions, e.g.
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(Illustrating \texttt{BEAMER}'s \texttt{pause} command.)

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Let’s try to find answers understandable by fifth graders (at least the more patient ones).
Cookie Approach

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Here let’s just use intuition, understandable by fifth graders. If we give 1/3 of a cookie to each person, how many people can we feed with 1 cookie? Obviously, the answer is 3. So we’ve derived the “invert and multiply” rule in a special case:

$$1 \div \frac{1}{3} = 3$$
But what if we give 2/3 of a cookie, not 1/3, to each person? We’re giving $2 \times$ as much per person. So we can feed only $\frac{1}{2}$ as many people. So we feed $\frac{1}{2} \times 3 = \frac{3}{2}$.\(^1\)
So we’ve derived the “invert and multiply” rule in another case:

$$1 \div \frac{2}{3} = \frac{3}{2}$$

\(^1\)One person gets only a half share.
Now, suppose we have only $\frac{4}{5}$ of a cookie. Then we can feed only $\frac{4}{5}$ as many people, i.e.

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$$\frac{4}{5} \times \frac{3}{2} \text{ people}$$

So we’ve derived the “invert and multiply” rule in the general case:

$$\frac{4}{5} \div \frac{2}{3} = \frac{4}{5} \times \frac{3}{2}$$
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A Geometry Proof

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A Geometry Proof

(Illustrating BEAMER’s \uncover command.)

Theorem

*The angles in a triangle sum to 180°.*
A Geometry Proof

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Theorem

*The angles in a triangle sum to \(180^\circ\).*

Plan: Extend AC past C to D. Draw CE parallel to AB.
Proof.
1. $u = y$
2. $v = x$
3. $z + u + v = 180^\circ$
ACD is a straight line.
4. $z + y + x = 180^\circ$
Substitution from Steps 1 and 2.
Proof.
1. \( u = y \)  
   Alternate angles of a transversal.

2. \( v = x \)  
   Consecutive interior angles of a transversal.

3. \( z + u + v = 180^\circ \)  
   \( \text{ACD is a straight line.} \)

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Proof.
1. $u = y$  \hspace{1cm} \text{Alternate angles of a transversal.}
2. $v = x$  \hspace{1cm} \text{Consecutive interior angles of a transversal}
3. $z + u + v = 180^\circ$  \hspace{1cm} \text{ACD is a straight line.}
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More Advanced Features of BEAMER

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- BEAMER has enough features to fill a 210-page user manual!
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