

# Using the CambridgeUS beamer theme

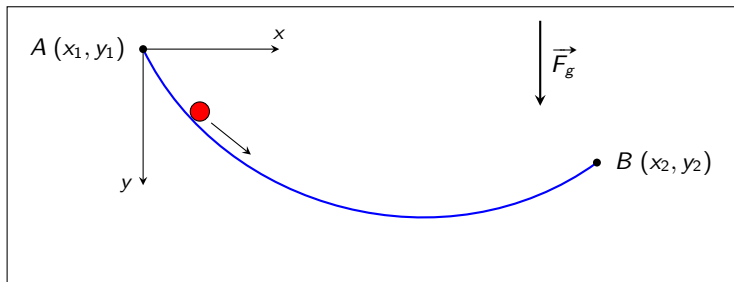
## Some Tests

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# The Brachistochrone Problem



Given two points  $A$  and  $B$  in a vertical plane, what is the curve traced out by a point acted on only by gravity, which starts at  $A$  and reaches  $B$  in the shortest time?

# A Few Algebraic Structures

Structure	ABO	Identity	Inverse	Distributive	Commutative	Comments
Semigroup	✓	no	no	N/A	no	$(S, \circ)$
Monoid	✓	✓	no	N/A	no	Semigroup plus identity $\in S$
Group	✓	✓	✓	N/A	no	Monoid plus inverse $\in S$
Abelian Group	✓	✓	✓	N/A	✓( $\circ$ )	Commutative group
Ring $_+$	✓	✓	✓	✓	✓(+)	Abelian group under +
Ring $_*$	✓	yes/no	no	✓	no	Monoid under *
Field $_{(+,*)}$	✓	✓(+, *)	✓(+, *)	✓	✓(+, *)	Abelian group under + and *
Vector Space	✓	✓(+, *)	✓(+)	✓	✓(+)	Abelian group under +, scalars $\in$ Field
Module	✓	✓(+, *)	✓(+)	✓	✓(+)	Abelian group under +, scalars $\in$ Ring

# What Are Prime Numbers?

## Definition

A **prime number** is a number that has exactly two divisors.

## Example

- 2 is prime (two divisors: 1 and 2).
- 3 is prime (two divisors: 1 and 3).
- 4 is not prime (**three** divisors: 1, 2, and 4).