MATH LIBRARY

Function and Constants

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SYMBOLIC CONSTANT FOR π

- **Header file:** `#include <cmath>` **or** `#include <math.h>`
- `using namespace std;`
- **Visual Studio (to use constants):** `#define _USE_MATH_DEFINES`
- **Symbolic constant for π:** `M_PI`

THE pow FUNCTION

- C++ does NOT have an exponentiation operator; use the pow function

- Requires `#include <cmath>` and `using namespace std;`

- double pow(double b, double e)

  - pow returns a double value

  - both pow arguments, b and e, are type double and each are automatically "grouped"

  - b^e = pow(b, e)

$$payment = \frac{PR}{1 - (1 + R)^{-N}}$$

```
double payment = P * R / (1 - pow(1 + r, -N));
```

THE sqrt FUNCTION

- Calculate the square root of an expression

- Requires `#include <cmath>` and `using namespace std;`

- double sqrt(double x)
  - sqrt returns a double and is automatically "grouped"
  - the argument, x, is type double
  - taking the square root of a negative number is illegal
  - $\sqrt{x}$ = sqrt(x)

$$double\ h = \sqrt{a^2 + b^2}$$

```
double h = sqrt(a*a + b*b);
```