

1.11 Math Class

Name: _____ Class: _____ Date: _____

Total: 9 marks

Objective

Build the skills to answer exam questions on **the Math class**.

You must be able to:

- call **Math class** 数学类 methods such as `Math.abs`, `Math.pow`, and `Math.sqrt`
- understand that `Math.pow(b, e)` computes b^e and returns a **double**
- generate a **pseudorandom** 伪随机 **double** in $[0, 1)$ with `Math.random`
- scale and shift `Math.random` to produce a random **int**

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Common Math methods

- `Math.abs(-5)` is 5.
- `Math.pow(2, 3)` is 8.0 (a **double**, since it computes 2^3).
- `Math.sqrt(9)` is 3.0.

■ Random values

`Math.random()` returns a **double** in the range $[0, 1)$. To get a random **int** from 1 to 6:

```
int roll = (int)(Math.random() * 6) + 1;
```

2 Practice

2.1 State the value of `Math.abs(-7)`. [1]

2.2 State the value **and type** of `Math.pow(3, 2)`. [2]

2.3 State the range of values `Math.random()` can return. [1]

3 Exam-style questions

3.1 `Math.sqrt(16)` returns [1]

- A 4 (an int)
 - B 4.0 (a double)
 - C 8.0
 - D 256
-

3.2 `Math.random()` returns a double in the range [1]

- A $[0, 1]$
 - B $[0, 1)$
 - C $[1, 10]$
 - D any value at all
-

3.3 To roll a die: `(int)(Math.random() * 6) + 1`.

(a) State the smallest possible value. [1]

(b) State the largest possible value. [1]

(c) State the value of `Math.pow(5, 0)`. [1]

4 Go further

- work through the **1.11 Math Class** lesson on the **Learn** page;
- read the **Using Objects** section of the AP Computer Science A handout on the **Know** page.

Solutions

2.1 7.

2.2 9.0, a double.

2.3 from 0 up to (but not including) 1.

3.1 B.

3.2 B.

3.3 (a) 1. (b) 6. (c) 1.0.