

Chapter 10 Object-Oriented Analysis and Design

1. The relationships among classes are association, composition, aggregation, and inheritance. For a summary of graphical notations, see Appendix G.

2.

Company and Employee: Aggregation

Course and Faculty: Association

Student and Person: Inheritance (Student is a subclass of Person)

House and Window: Composition

Account and Savings Account: Inheritance

3.

The output is

```
1/3 + 1/2 = 5/6
1/2 + 1/3 = 5/6
1/3 - 1/2 = -1/6
1/2 - 1/3 = 1/6
1/3 * 1/2 = 1/6
1/2 * 1/3 = 1/6
1/3 / 1/2 = 2/3
1/2 / 1/3 = 3/2
1/3 = 0.3333333333333333
1/2 = 0.5
```

4.

Line 4

```
System.out.println(r.add(new Rational()));
```

is wrong, because r's type is Number, it doesn't have the add method.

Line 5

```
System.out.println((Rational)r.add(new Rational()));
```

is wrong, because the . operator is performed before casting.

5.

Line 1

```
Number r = new Number();
```

is wrong, because Number is an abstract class.

6.

(A)

Yes.

Line 1 is fine, since Rational implements Comparable.

Line 2 is fine, since any object is also an instance of the Object class.

(B)

Yes.

Line 1 is fine, since Rational implements Comparable.

Line 2 is fine, since any object is also an instance of the Object class.