 Name: _____

Date: _____ Period: _____

19. A class `Date` has methods `int getMonth()` and `int getDay()`. Write a method

```
public boolean has3OnSameDay(Date[] birthdays)
```

that returns true if at least three birthdays in the array fall on the same date. Your method should work in $O(n)$ time, where n = `birthdays.length`.

20. Consider the following class:

```
public class Person
{
  private String name;
  private int age;      // age <= 125

  public boolean equals(Object other)
  {
    if (!(other instanceof Person))
      return false;
    Person otherPerson = (Person)other;
    return name.equals(otherPreson.name) && age == otherPerson.age;
  }

  < Constructors and other methods not shown >
}
```

Write a `hashCode` method for this class that agrees with the `equals` method and returns different values for `Person`s of different ages.

21. A `Scanner input` is associated with a text file, open for reading, that contains words. Write a method

```
public String mostFrequentWord(Scanner input)
```

that returns the most frequently occurring word (or any one of such words). Use a `Map<String, Integer>` to hold the counts for different words.

22. Consider a class

```
public class MyHashTable
{
  private ArrayList<LinkedList<String>> buckets;
  private int numItems;
  private double loadFactorLimit;

  public MyHashTable()
  {
    this(16, 0.75);
  }

  public MyHashTable(int capacity, double limit)
  {
    buckets = new ArrayList<LinkedList<String>>(capacity);
    for (int count = 1; count <= capacity; count++)
      buckets.add(new LinkedList<String>());
    numItems = 0;
    loadFactorLimit = limit;
  }

  public boolean add(String str)
  {
    if ( ____________________________________________________ )
      resize(2 * buckets.size());
    int index = str.hashCode() % buckets.size();

    ____________________________________________________;

    ____________________________________________________;

    ____________________________________________________;

    ____________________________________________________;

    return true;
  }
  < Other methods not shown >
}
```

Fill in the blanks in the `add` method.