Polymorphism Worksheet - Inheritance +Compiling

```
public class Animal {
   public Animal() {
      System.out.println("Animal");
   }
}
public class Mammal extends Animal {
   public Mammal() {
      System.out.println("Mammal");
   }
}
public class Cat extends Mammal {
   public Cat() {
      System.out.println("Cat");
   }
}
```

1. What is the parent class of *Animal*?

   Object

2. Is *Cat* a subclass of *Animal*?

   Yes

3. What will be displayed when a new instance of *Cat* is created?

   Animal
   Mammal
   Cat

4. Is the definition

```
Animal rex = new Cat();
```

   legal?

   Yes

5. Given the above definition of `rex`, and the definitions

```
Animal lizzy = new Animal();
Cat tigger = new Cat();
```

Which of the following assignments are legal (will compile)?

a) `lizzy = tigger;`
b) `tigger = rex;` **Won't compile**
c) `tigger = (Cat)rex;`
d) `if (rex instanceof Cat)`
`tigger = rex;` **Won't compile**

6. Given all the above definitions of *Animal*, *Mammal*, *Cat*, `rex`, `lizzy`, and `tigger`, the method `hasFur` is specified as

```
public boolean hasFur (Mammal m);
```

Which of the following are legal (will compile)?

a) `hasFur (lizzy);` **Won't compile**
b) `hasFur (rex);` **Won't compile**
c) `hasFur (tigger);`
d) `hasFur ((Mammal)lizzy);`
e) `hasFur ((Mammal)rex);`