```
class Klass:
    def __init__(self, x):
        self.xcoord = x

    def act_on(self, value):
        self.xcoord += value

k = Klass(4)
```

Which of the following best describes the code elements above

A. Klass is a class, xcoord an instance variable, act_on a method, k an instance
B. Klass is a class, xcoord a method, act_on an instance variable, k an instance
C. Klass and k are instances, xcoord an instance variable, act_on a method
D. Klass and k are classes, xcoord an instance variable, act_on a method
E. Klass is a class, xcoord and act_on are methods, k is an instance

Answer: A

Klass is a class definition, xcoord is an instance variable and act_on a method of that class, while k is an instance of that class.

```
class Klass:
    def __init__(self, x):
        self.xcoord = x

    def act_on(self, value):
        self.xcoord += value

k = Klass(4)
k.act_on(2)
```

After the above code executes, what is the value of `k.xcoord`?

A. "x"
B. 0
C. 2
D. 4
E. 6

Answer: E

After initialization, the value of k.xcoord is 4. After the act_on method, k.xcoord is incremented by 2 to a final value of 6

```
r1 = Rational(1, 10)
r2 = Rational(2, 10)
r3 = r1 + r2
print(r2)
```

__init__
__init__
__add__
__str__

r3 == r1 + r2

Which correctly describes the methods on Rational executed in the above code?

A. __init__
B. __init__, __add__
C. __init__, __str__
D. __init__, __add__, __str__
E. __init__, __add__, __str__, __eq__

Answer: D

Creating the Rational objects invokes __init__, the + invokes __add__, while the print invokes __str__.

```
class A:
    def __init__(self, x):
        self.x = x

    def act_on(self, value):
        self.x += value
```

```
class B(A):
    def __init__(self, x, y):
        super().__init__(x)
        self.y = y

    def act_on(self, value):
        self.x += self.y*value

val = B(4, 2)
val.act_on(2)
```

After the above code executes, what is the value of `val.x`?

A. 6
B. 8
C. 10
D. 16
E. 20

Answer: B

After initialization, the value of val.xcoord is 4. The act_on method in B overrides that in A, so the final expression is 4 + 2 * 2

```
d1 = Dollar(10)
d2 = Dollar(20)
d3 = d1 + d2
```

Which correctly describes the methods executed in the above code (listed as class.method)?

A. Dollar.__init__
B. Rational.__init__
C. Dollar.__init__, Rational.__init__
D. Dollar.__init__, Rational.__init__, Rational.__add__
E. Dollar.__init__, Rational.__init__, Rational.__add__, Dollar.__add__

Answer: D

Creating the Dollar object first invokes Dollar.__init__, then the initializer of the parent class Rational.__init__. Adding dollars reuses the __add__ method defined in Rational, i.e., it doesn't have its own __add__ method.