Ruby - Feature #13506

Improve performance of Complex#{+,-,*,/,**,abs2}

04/25/2017 05:25 AM - watson1978 (Shizuo Fujita)

Status:	Open
Priority:	Normal
Assignee:	
Target version:	

Description

At the internal calculation in Complex methods,
it will just call Ruby #{+,-,*,/} methods via rb_funcall().

This patch will provide the optimization path for calculation
using #{+,-,/,*} methods for internal Fixnum objects.

Before

```
Calculating -------------------------------------
           Complex#+      5.186M (± 4.9%) i/s -     25.937M in   5.013851s
           Complex#-      5.209M (± 5.9%) i/s -     26.038M in   5.017972s
           Complex#*      3.211M (± 5.2%) i/s -     16.170M in   5.051605s
           Complex#/    537.251k (± 3.9%) i/s -      2.691M in   5.017513s
          Complex#**      1.540M (± 3.0%) i/s -      7.726M in   5.019918s
        Complex#abs2      7.050M (± 7.9%) i/s -     35.047M in   5.009324s
```

After

```
Calculating -------------------------------------
           Complex#+      7.265M (± 4.6%) i/s -     36.341M in   5.013803s
           Complex#-      7.310M (± 4.5%) i/s -     36.540M in   5.009521s
           Complex#*      6.402M (± 4.0%) i/s -     32.060M in   5.016835s
           Complex#/    541.564k (± 3.3%) i/s -      2.744M in   5.072620s
          Complex#**      1.490M (± 4.0%) i/s -      7.506M in   5.046460s
        Complex#abs2     17.799M (± 6.6%) i/s -     88.688M in   5.007732s
```

Test code

```
require 'benchmark/ips'

Benchmark.ips do |x|
  c1 = Complex(2, 3)
  c2 = Complex(2, 3)

  x.report "Complex#+" do |t|
    t.times { c1 + c2 }
  end

  x.report "Complex#-" do |t|
    t.times { c1 - c2 }
  end

  x.report "Complex#*" do |t|
    t.times { c1 * c2 }
  end

  x.report "Complex#/" do |t|
    t.times { c1 / c2 }
  end

  x.report "Complex#**" do |t|
    t.times { c1 ** c2 }
  end
```

```
  x.report "Complex#abs2" do |t|
    t.times { c1.abs2 }
  end
end
```

Patch

https://github.com/ruby/ruby/pull/1597

History

#1 - 06/24/2019 08:21 PM - jeremyevans0 (Jeremy Evans)

- Tracker changed from Bug to Feature

- Backport deleted (2.2: UNKNOWN, 2.3: UNKNOWN, 2.4: UNKNOWN)