
Subject: Re: fractional powers of negative numbers?
Posted by [Med Bennett](#) on Thu, 24 Apr 1997 07:00:00 GMT
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Actually, I guess i answered my own question:

```
IDL> print,(-5.)^1.51
-1.#IND0
% Program caused arithmetic error: Floating illegal operand
```

I thought the previous syntax was unambiguous, but...

Subject: Re: fractional powers of negative numbers?
Posted by [thompson](#) on Mon, 28 Apr 1997 07:00:00 GMT
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Jack Saba <jsaba@magus.stx.com> writes:

> IDL is computing -(5.^1.51) in your example. If you try (-5.)^1.51, you
> will get an error.

> Med Bennett wrote:

```
>>
>> Can someone explain this to me? Is it possible to compute the fractional
>> power of a negative number? IDL does it on single negative values but
>> not on arrays containing negative values.
>>
>> IDL> print,findgen(11)-5
>> -5.00000 -4.00000 -3.00000 -2.00000
>> -1.00000 0.000000 1.00000 2.00000
>> 3.00000 4.00000 5.00000
>> IDL> print,(findgen(11)-5)^1.51
>> -1.#IND0 -1.#IND0 -1.#IND0 -1.#IND0
>> -1.#IND0 0.000000 1.00000 2.84810
>> 5.25355 8.11168 11.3617
>> % Program caused arithmetic error: Floating illegal operand
>> IDL> print,-2.^1.51
>> -2.84810
>> IDL> print,-5.^1.51
>> -11.3617
```

The only way to compute the fractional power of a negative number is to use complex arithmetic, e.g.

```
IDL> print,complex(findgen(11)-5,fltarr(11))
```

```

( -5.00000, 0.00000)( -4.00000, 0.00000)
( -3.00000, 0.00000)( -2.00000, 0.00000)
( -1.00000, 0.00000)( 0.00000, 0.00000)
( 1.00000, 0.00000)( 2.00000, 0.00000)
( 3.00000, 0.00000)( 4.00000, 0.00000)
( 5.00000, 0.00000)

IDL> print,(complex(findgen(11)-5,fltarr(11)))^1.51
% Program caused arithmetic error: Floating overflow
% Detected at $MAIN$
% Program caused arithmetic error: Floating illegal operand
% Detected at $MAIN$
% Program caused arithmetic error: Floating illegal operand
% Detected at $MAIN$
( 0.356881, -11.3561)( 0.254794, -8.10767)
( 0.165018, -5.25096)( 0.0894611, -2.84669)
( 0.0314108, -0.999507)( NaNQ, NaNQ)
( 1.00000, 0.00000)( 2.84810, 0.00000)
( 5.25355, 0.00000)( 8.11168, 0.00000)
( 11.3617, 0.00000)

```

Interestingly enough, here it complains about taking (0,0) to a fractional power. I would have said that (0,0) to any power was still (0,0).

Bill Thompson

Subject: Re: fractional powers of negative numbers?
Posted by [Jack Saba](#) **on** Mon, 28 Apr 1997 07:00:00 GMT
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> Med Bennett
> bennettm@boulder.pti-enviro.com
```
