# Subject: Approximate distance calculation 

Posted by mirek on Sat, 26 Aug 2017 07:55:49 GMT
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While working on OSD firmware for my FPV plane, I have started playing with the idea how to calculate fast distance approximation:

```
int ihypot(int x, int y)
\{
if( \(\mathrm{x}<0\) )
x = -x;
if( \(y<0\) )
\(\mathrm{y}=-\mathrm{y}\);
if( \(x<y\) )
Swap(x, y);
if( \(\mathrm{y}<(\mathrm{x} \gg 2)+(\mathrm{x} \gg 3)\) )
return \(x+(y \gg 3)+(y \gg 5)\);
\(y-=(x \gg 2)+(x \gg 5)\);
return \(x+(y \gg 1)+(y \gg 4) ;\)
\}
```

This is approximation of $\operatorname{sqrt}\left(x^{*} x+y^{*} y\right)$.

- if $\max (x, y)<168$, absolute error < 4 (this has more to do with integer rounding) - otherwise, the error is less than $2 \%$

Putting it here so that perhaps it can be googled if somebody is looking for something like it...

