



solve $x^2 + x^2 - 2*x*x*\cos(72 \text{ degree}) = 1 + 1 - 2*\cos(144 \text{ degree})$ for x



Input interpretation :

solve

$$x^2 + x^2 - 2 x x \cos(72^\circ) = 1 + 1 - 2 \cos(144^\circ)$$

for

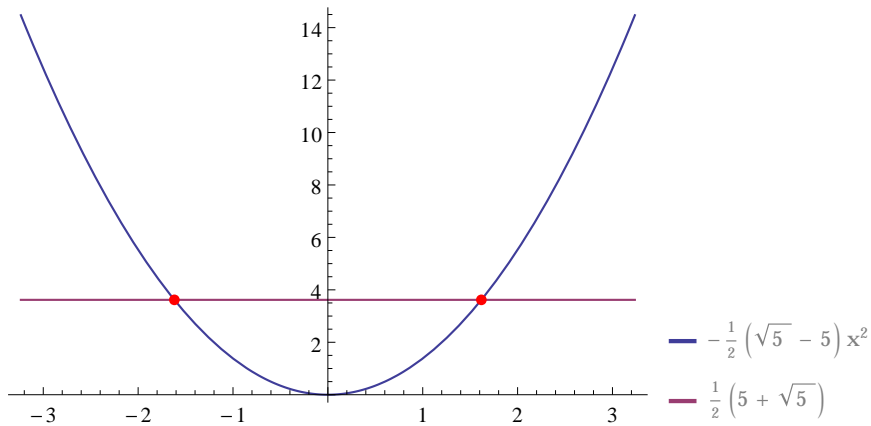
x



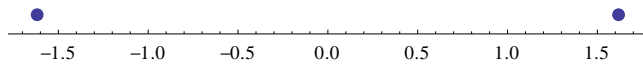
Result:

$$x = \pm \sqrt{\frac{1}{2} (3 + \sqrt{5})} \approx \pm 1.61803$$

Plot:



Number line:





`sqrt((5+sqrt(5))/(5-sqrt(5))) {sin(36 degree),sin(72 degree)}`



Input:

$$\sqrt{\frac{5 + \sqrt{5}}{5 - \sqrt{5}}} \{ \sin(36^\circ), \sin(72^\circ) \}$$



Result:

$$\sqrt{\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} \quad | \quad \sqrt{\frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}}$$

Alternate forms:

$$\frac{1}{2} \sqrt{\frac{1}{2}(5 + \sqrt{5})} \quad | \quad \sqrt{\frac{5}{4} + \frac{\sqrt{5}}{2}}$$

Decimal approximation:

0.951057 | 1.53884

Difference:

$$\sqrt{\frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} - \sqrt{\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} =$$

$$\sqrt{\frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} - \sqrt{\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} \approx 0.587785$$

Ratio:

$$\frac{\sqrt{\frac{\left(\frac{5}{8}-\frac{\sqrt{5}}{8}\right)(5+\sqrt{5})}{5-\sqrt{5}}}}{\sqrt{\frac{\left(\frac{5}{8}+\frac{\sqrt{5}}{8}\right)(5+\sqrt{5})}{5-\sqrt{5}}}} = \sqrt{\frac{1}{2}(3-\sqrt{5})} \approx 0.618034$$

Percent increase:

61.80%

Total:

$$\sqrt{\frac{\left(\frac{5}{8}-\frac{\sqrt{5}}{8}\right)(5+\sqrt{5})}{5-\sqrt{5}}} + \sqrt{\frac{\left(\frac{5}{8}+\frac{\sqrt{5}}{8}\right)(5+\sqrt{5})}{5-\sqrt{5}}} \approx 2.4899$$

Vector length:

$$\sqrt{\frac{\left(\frac{5}{8}-\frac{\sqrt{5}}{8}\right)(5+\sqrt{5})}{5-\sqrt{5}} + \frac{\left(\frac{5}{8}+\frac{\sqrt{5}}{8}\right)(5+\sqrt{5})}{5-\sqrt{5}}} \approx 1.80902$$

Normalized vector:

$$\left(\begin{array}{c} \sqrt{\frac{\left(\frac{5}{8}-\frac{\sqrt{5}}{8}\right)(5+\sqrt{5})}{5-\sqrt{5}}} \\ \sqrt{\left(5-\sqrt{5}\right)\left(\frac{\left(\frac{5}{8}-\frac{\sqrt{5}}{8}\right)(5+\sqrt{5})}{5-\sqrt{5}} + \frac{\left(\frac{5}{8}+\frac{\sqrt{5}}{8}\right)(5+\sqrt{5})}{5-\sqrt{5}}\right)} \end{array} \right),$$

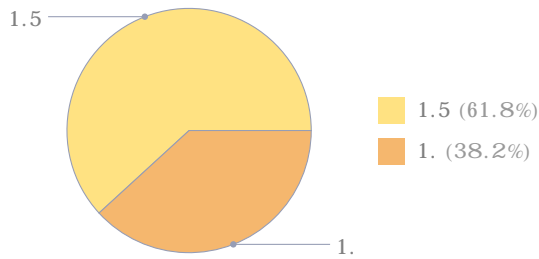
$$\left(\begin{array}{c} \sqrt{\frac{\left(\frac{5}{8}+\frac{\sqrt{5}}{8}\right)(5+\sqrt{5})}{5-\sqrt{5}}} \\ \sqrt{\left(5-\sqrt{5}\right)\left(\frac{\left(\frac{5}{8}-\frac{\sqrt{5}}{8}\right)(5+\sqrt{5})}{5-\sqrt{5}} + \frac{\left(\frac{5}{8}+\frac{\sqrt{5}}{8}\right)(5+\sqrt{5})}{5-\sqrt{5}}\right)} \end{array} \right)$$

Angles between vector and coordinate axes

$$\text{horizontal: } \cos^{-1} \left(\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8} \right) (5 + \sqrt{5})}{(5 - \sqrt{5}) \left(\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8} \right) (5 + \sqrt{5})}{5 - \sqrt{5}} + \frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8} \right) (5 + \sqrt{5})}{5 - \sqrt{5}} \right)} \right)$$

$$\text{vertical: } \cos^{-1} \left(\frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8} \right) (5 + \sqrt{5})}{(5 - \sqrt{5}) \left(\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8} \right) (5 + \sqrt{5})}{5 - \sqrt{5}} + \frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8} \right) (5 + \sqrt{5})}{5 - \sqrt{5}} \right)} \right)$$

Pie chart:



Polar coordinates

$r \approx 1.80902$ (radius), $\theta \approx 58.2825^\circ$ (angle)



sqrt((5+sqrt(5))/(5-sqrt(5))) {sin(36 degree),sin(72 degree)}

Examples Random

Assuming multiplication | Use a list instead

Assuming angular degrees for "degree" | Use degrees Fahrenheit of temperature or instead

Input:

$$\sqrt{\frac{5 + \sqrt{5}}{5 - \sqrt{5}}} \{\sin(36^\circ), \sin(72^\circ)\}$$

Result:

$$\left\{ \sqrt{\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}}, \sqrt{\frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} \right\}$$

Alternate forms:

$$\left\{ \frac{1}{2} \sqrt{\frac{1}{2}(5 + \sqrt{5})}, \sqrt{\frac{5}{4} + \frac{\sqrt{5}}{2}} \right\}$$

$$\left\{ \frac{1}{2} \sqrt{\frac{1}{2}(5 + \sqrt{5})}, \frac{1}{2} \sqrt{5 + 2\sqrt{5}} \right\}$$

$$\left\{ \sqrt{\frac{1}{2}(3 + \sqrt{5})} \sin(36^\circ), \sqrt{\frac{1}{2}(3 + \sqrt{5})} \cos(18^\circ) \right\}$$

Decimal approximation:

{0.951057, 1.53884}

Difference:

$$\sqrt{\frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} - \sqrt{\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} = \sqrt{\frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} - \sqrt{\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} \approx 0.587785$$

Ratio:

$$\frac{\sqrt{\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}}}{\sqrt{\frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}}} = \sqrt{\frac{1}{2}(3 - \sqrt{5})} \approx 0.618034$$

Percent increase:

61.80%

Total:

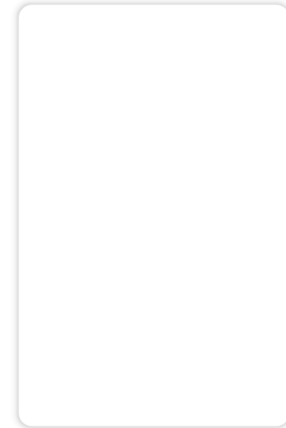
$$\sqrt{\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} + \sqrt{\frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} \approx 2.4899$$

Vector length:

$$\sqrt{\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}} + \frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}} \approx 1.80902$$

Normalized vector:

(



Related Wolfram|Alpha Queries

norm(sqrt((5+sqrt(5))/(5-sqr...

maximum of sqrt((5+sqrt(5))...

quadratic fit sqrt((5+sqrt(5...

{1, -1, 0}x{0, 1, -1}

Related Links

Sin (in *Mathematica*) »

$$\sqrt{\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{(5 - \sqrt{5})\left(\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}} + \frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}\right)}}$$

$$\sqrt{\frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{(5 - \sqrt{5})\left(\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}} + \frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}\right)}}$$

Angles between vector and coordinate axes:

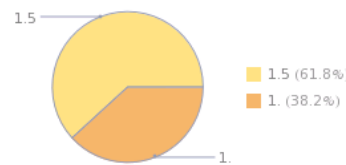
Approximate form

horizontal: $\cos^{-1}\left(\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{\sqrt{(5 - \sqrt{5})\left(\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}} + \frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}\right)}}\right)$

vertical: $\cos^{-1}\left(\frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{\sqrt{(5 - \sqrt{5})\left(\frac{\left(\frac{5}{8} - \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}} + \frac{\left(\frac{5}{8} + \frac{\sqrt{5}}{8}\right)(5 + \sqrt{5})}{5 - \sqrt{5}}\right)}}\right)$

$\cos^{-1}(x)$ is the inverse cosine function »

Pie chart:



Polar coordinates:

Exact form

$r \approx 1.80902$ (radius), $\theta \approx 58.2825^\circ$ (angle)

Computed by Wolfram Mathematica

Computation timed out. Experimental feature: Try again with more time »

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