

Mathematica による (3,4,5) の勾股弦での検算

研幾算法9

```

Clear[a, c, x];
a =  $\frac{145}{7}$ ;
c = 5;
NSolve[(a - (c^2 - x^2 + x))^2 x^2 == (x - (a - (c^2 - x^2 + x)))^2 (c^2 - x^2), x]
Expand[(a - (c^2 - x^2 + x))^2 x^2 - (x - (a - (c^2 - x^2 + x)))^2 (c^2 - x^2)]
Factor[(a - (c^2 - x^2 + x))^2 x^2 - (x - (a - (c^2 - x^2 + x)))^2 (c^2 - x^2)]

{{x  $\sqrt{-3.91822}$ }, {x  $\sqrt{-1.36366}$ }, {x  $\sqrt{-1.20991}$ }, {x  $\sqrt{3.}$ }, {x  $\sqrt{3.2459 - 1.14121 I}$ },
{x  $\sqrt{3.2459 + 1.14121 I}$ }}

-  $\frac{22500}{49}$  -  $\frac{3000 x}{7}$  +  $\frac{7400 x^2}{49}$  +  $\frac{880 x^3}{7}$  -  $\frac{260 x^4}{7}$  - 6 x^5 + 2 x^6

 $\frac{2}{49} (-3 + x) (3750 + 4750 x + 350 x^2 - 910 x^3 + 49 x^5)$ 

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「算法乗除往来」の数値で検算

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Clear[a, c, x];
a = 147.865216;
c = 12.4;
NSolve[(a - (c^2 - x^2 + x))^2 x^2 == (x - (a - (c^2 - x^2 + x)))^2 (c^2 - x^2), x]
Expand[(a - (c^2 - x^2 + x))^2 x^2 - (x - (a - (c^2 - x^2 + x)))^2 (c^2 - x^2)]

{{x  $\sqrt{-9.19291}$ }, {x  $\sqrt{-1.66328}$ }, {x  $\sqrt{-1.581}$ }, {x  $\sqrt{3.472}$ }, {x  $\sqrt{3.9919}$ }, {x  $\sqrt{7.97329}$ }}

- 5342.93 - 3625.53 x + 1267.22 x^2 + 650.409 x^3 - 172.339 x^4 - 6 x^5 + 2 x^6

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研幾算法11

```

Clear[a, b, x];
a =  $\frac{29}{5}$ ;
b = 9;
NSolve[
(a ((2 b - 3 x)^2 + x^2) - 2 (2 b - 3 x) x^2) (2 b - 3 x) == 2 ((2 b - 3 x - x) x ((2 b - 3 x)^2 + x^2)), x]
Expand[
(a ((2 b - 3 x)^2 + x^2) - 2 (2 b - 3 x) x^2) (2 b - 3 x) - 2 ((2 b - 3 x - x) x ((2 b - 3 x)^2 + x^2))]
Factor[
(a ((2 b - 3 x)^2 + x^2) - 2 (2 b - 3 x) x^2) (2 b - 3 x) - 2 ((2 b - 3 x - x) x ((2 b - 3 x)^2 + x^2))]

{{x  $\sqrt{3.}$ }, {x  $\sqrt{4.24303}$ }, {x  $\sqrt{5.91075 - 2.81488 I}$ }, {x  $\sqrt{5.91075 + 2.81488 I}$ }}

 $\frac{169128}{5}$  -  $\frac{142884 x}{5}$  +  $\frac{43776 x^2}{5}$  - 1182 x^3 + 62 x^4

 $\frac{2}{5} (-3 + x) (-28188 + 14418 x - 2490 x^2 + 155 x^3)$ 

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研幾算法24

```
Clear[a, b, x];
a = 33;
b = 3;
NSolve[8 b x + (2 a - (2 (x^2 + b^2) + 3 x))^2 == 4 (b + x) (2 a - (2 (x^2 + b^2) + 3 x)), x]
Expand[8 b x + (2 a - (2 (x^2 + b^2) + 3 x))^2 - 4 (b + x) (2 a - (2 (x^2 + b^2) + 3 x))]
Factor[8 b x + (2 a - (2 (x^2 + b^2) + 3 x))^2 - 4 (b + x) (2 a - (2 (x^2 + b^2) + 3 x))]

{{x  $\bar{E}$  - 6.72008}, {x  $\bar{E}$  - 5.30778}, {x  $\bar{E}$  3.02786}, {x  $\bar{E}$  4.}}
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$$1728 - 420 x - 147 x^2 + 20 x^3 + 4 x^4$$
$$(-4 + x) (-432 - 3 x + 36 x^2 + 4 x^3)$$