$r_a \cdot r_b + r_b \cdot r_c + r_c \cdot r_a = s^2$, where r_i is the excircle radius opposite $side_i$

$1 \cdot 3 + 3 \cdot 2 + 2 \cdot 1 = 11$ so that $s = \sqrt{11}$ .... [1]

where $s = \dfrac{a+b+c}{2}$ and a, b, c are the sides of the triangle.................................... [2]

$r_a = \dfrac{2A}{c-a+b}$ .... [3]

$r_b = \dfrac{2A}{a-b+c}$ .... [4]

$r_c = \dfrac{2A}{a+b-c}$, where A is the area of the triangle .... [5]

from [3] with r_a known to be 1: c – a + b =2A .... [6]
from [4] with r_b known to be 3: 3a – 3b +3c = 2A.. [7]
from [5] with r_c known to be 2: 2a +2b -2c = 2A... [8]
equating [6] and [7]: c – a +b = 3a -3b +3c and 2a = 2b – c .... [9]
equating [6] and [8]: c – a + b = 2a +2b- 2c and b = 3c – 3a .... [10]
equating [7] and [8]: 3a -3b +3c = 2a + 2b -2c and a = 5b -5c............................. [11]

subtracting twice [11] from [9]: $b = \dfrac{9c}{8}$ .... [12]

substituting [12] into [11]: $a = 5 \cdot \dfrac{9c}{8} - 5c = \dfrac{5c}{8}$ .... [13]

substituting the values from [12] and [13] into [2] and squaring to equal [1]:

$$\left(\frac{\frac{5c}{8} + \frac{9c}{8} + c}{2} \right)^2 = 11$$, from which c = 2.4120908

substituting back into [12] and [13], a = 1.5075567 and b = 2.713602