NCERT 11.9.3 28Q

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Question: The sum of two numbers is 6 times their geometric mean, show that numbers are in the ratio $\frac{(3+2\sqrt{2})}{(3-2\sqrt{2})}$.

Solution: Let the two numbers be a and b

Parameter	Description	Value
$G.M$	GM of two numbers	$\sqrt{ab}$

TABLE 1: Input table

FromTable 1:

$$a + b = 6\sqrt{ab} \tag{1}$$

$$(a+b)^2 = 36ab \tag{2}$$

Also,

$$(a-b)^2 = (a+b)^2 - 4ab \tag{3}$$

$$(a-b)^2 = 32ab \tag{4}$$

$$(a-b) = 4\sqrt{2}\sqrt{ab} \tag{5}$$

Adding (1) and (5):

Parameter	Description	Value
a	first number	$(3+2\sqrt{2})\sqrt{ab}$
b	second number	$(3-2\sqrt{2})\sqrt{ab}$

TABLE 2: result table

From Table 2:

$$\frac{a}{b} = \frac{(3+2\sqrt{2})}{(3-2\sqrt{2})} \tag{6}$$