Nine Stone Puzzle

A Vissionary tells you that a certain shopkeeper has nine stones which look absolutely identical but that one stone is actually an extemely valuable gem while the other eight are worthless baubles. The worthless eight are exactly the same. But the valuable gem is just slightly (and imperceptibly) heavier. Each stone costs nine dollars but you only have 27 dollars.

The shopkeeper will also allow you to use a very precise equal-arm balance but each measurement costs nine dollars. This equal-arm balance only tells you that one side of the balance is heavier than the other. One can put any number of objects on either side of the balance.

With 18 dollars you can buy just two measurements with 8 dollars left over to buy one of the nine stones. *What measurements can you make to identify the valuable gem with absolute certainty?*

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