

# Quantitative comparison and number reasoning

GRE General Test

## Scope and task

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Original classroom practice within the reviewed shorter-test task types. This does not simulate an adaptive test or predict a scaled or writing score.

- Compare quantities across all allowed values
- Use arithmetic, ratios, divisibility and powers
- Recognise when the relationship cannot be determined

**constraint** : A condition limiting allowed values.

**indeterminate** : Not fixed by the given information.

## Read the evidence and choose a method

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Quantitative Comparison has four fixed relationships: A greater, B greater, equal, or cannot determine.

Check all constraints. A variable can be negative, zero or fractional unless the stem restricts it.

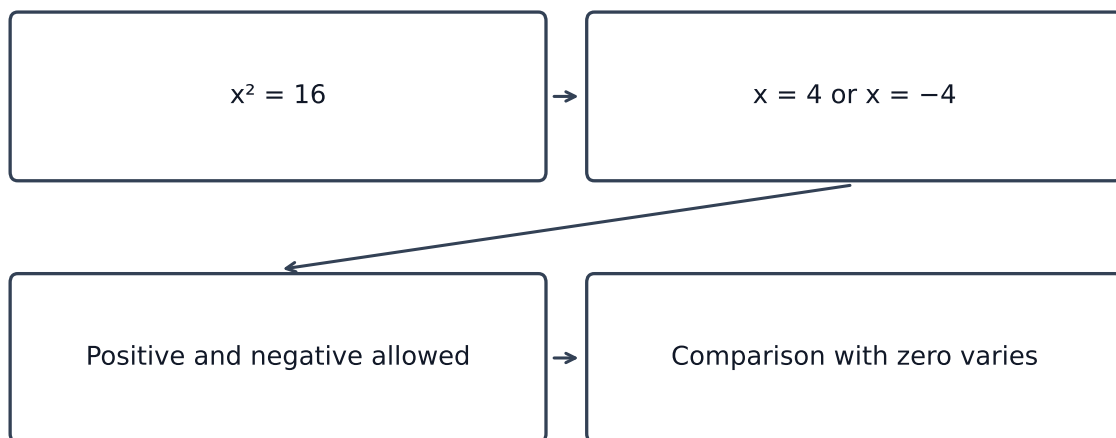
Use strategic substitutions to disprove a fixed relation. They can show indeterminacy but a few examples do not prove universality.

Simplify both quantities without silently dividing by a value that could be zero or negative.

## Worked reasoning

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Given  $x^2=9$ ,  $x$  can be 3 or  $-3$ . Quantity  $A=x$ ;  $B=0$ .  $A$  is greater for 3 and smaller for  $-3$ , so the relationship cannot be determined. If  $x$  is positive, only 3 is allowed and  $A$  is greater.



*$x^2 = 16$  allows  $x = 4$  or  $x = -4$ , so the comparison with zero is not fixed*

## Conditions and common errors

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Figures are not necessarily drawn to scale. Given labels and constraints carry the evidence.

## Original application

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Quantitative Comparison uses these relationships: A. Quantity A is greater. B. Quantity B is greater. C. Equal. D. Cannot be determined. Given real  $x$  with  $x^2 = 16$ , compare Quantity A:  $x$ , Quantity B: 0. Repeat with the added condition  $x > 0$ .

### ■ Model and reasoning

Without the added condition, **D**:  $x=4$  makes A greater, while  $x=-4$  makes B greater. With  $x > 0$ , **A**, because only  $x=4$  is permitted. The principal square root of 16 is four, but the equation has both roots. One chosen example cannot prove a relationship over all allowed values.

## Independent transfer

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With the same four answer categories, let  $a > 0$  and  $b < 0$ . Compare Quantity A:  $a/b$ , Quantity B:  $b/a$ . Give admissible examples if the relationship can vary, and identify when equality occurs.

■ **Check after attempting**

**D.** For  $a=2, b=-1$ ,  $A=-2$  and  $B=-1/2$ , so  $B$  is greater. For  $a = 1, b=-2$ ,  $A=-1/2$  and  $B=-2$ , so  $A$  is greater. For  $a = 1, b=-1$  they are equal. More generally  $a/b = b/a$  means  $a^2 = b^2$ , and the stated opposite signs give  $a=-b$ . Multiplying an inequality by the negative product  $ab$  reverses direction; ignoring this sign would reverse conclusions.