$$
\begin{aligned}
x^2 - 3x + 4 & & (1)\\
3x + 6 &= 8 & (2)\\
3 &= 1 + 2 & (3)\\
3 &= 4 & (4)\\
(2x + 1) &= x + (x + 1) & (5)
\end{aligned}
$$

1) Definitions have to stay the same when you replace an equation with an equivalent one.

2) Do we want to focus on form or truth?

$\exists x$ s.t. $3x+6=8$

- There exists a number x such that $\boxed{3x + 6 = 8}$.
- The number $x = 53$ is not a solution to the equation $3x+6 = 8$.
- If $x = 2/3$ then $\boxed{3x + 6 = 8}$.

  $\forall x \ldots$
- For all numbers x we have $2x + 1 = x + (x + 1)$.

$3=4$

An equation is...

a numerical statement that sets two mathematical values equivalent to each other.

a statement that includes an equal sign where the value on either side is equivalent.

a mathematical statement that denotes equality

A relationship between 2 mathematical statements

a direct comparison between 2 mathematical statements using an equal sign.

→ a statement with an equal sign which asserts the equivalence of two quantities

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Theorem

If x is a solution to $3x+6=8$, then $x=\frac{2}{3}$

Proof

If x is such that $3x+6=8$,

then $3x = 2$, because ....

Therefore, $x = \frac{2}{3}$, because ...

Rules of arithmetic (things that come after the because).

Commutative law ...