

September 30th

$$(x^2 - 5x + 5)^{x^2 - 9x + 20} = 1$$

Here, use the fact that $x^0 = 1$ (except $x=0$) and $1^y = 1$

Hence

$$x^2 - 9x + 20 = 0$$

$$(x - 4)(x - 5) = 0$$

$$x = 4, x = 5$$

OR

$$x^2 - 5x + 5 = 1$$

$$x^2 - 5x + 4 = 0$$

$$(x - 4)(x - 1) = 0$$

$$x = 4, x = 1$$

Also $(-1)^{\text{even}} = 1$

$$x^2 - 5x + 5 = -1, \text{ so } x = 2 \text{ or } x = 3$$

When $x = 2$, $x^2 - 9x + 20$ is even

When $x = 3$, $x^2 - 9x + 20$ is even

So $x = 1, 2, 3, 4$ or 5