

Factor the trinomial completely.

$$29a^2 + 5a^4 + 20$$

Select the correct choice below and fill in any answer boxes within your choice.

☐ A. $29a^2 + 5a^4 + 20 = \blacksquare$

(Factor completely.)

☐ B. The polynomial is prime.

You can solve this without substituting.
Write in standard form

$$5a^4 + 29a^2 + 20.$$

By double X

$$\begin{array}{ccc} & 100 & \\ 25 & \times & 4 \\ & 29 & \end{array}$$

$$= 5a^4 + 25a^2 + 4a^2 + 20$$

$$= 5a^2(a^2 + 5) + 4(a^2 + 5)$$

$$= \boxed{(a^2 + 5)(5a^2 + 4)}$$

$$\begin{array}{ccc} & 100 & \\ 25 & \times & 4 \\ & 29 & \end{array}$$

$$\begin{aligned} & 5m^2 + 25m + 4m + 20 \\ &= 5m(m+5) + 4(m+5) \\ &= (m+5)(5m+4) \end{aligned}$$

Because we've usually done problems like $5x^2 + 29x + 20$, the suggestion to substitute $m = a^2$ is to help you focus on getting the correct #'s in your factors.

If you substitute $m = a^2$, you get $5m^2 + 29m + 20$ which you could factor by ~~X~~ or by guess & check to get:

$$(5m + 4)(m + 5).$$

Then substitute back $m = a^2$:

$$\boxed{(5a^2 + 4)(a^2 + 5)}.$$

Substitution is often used to temporarily make a more complicated problem look less complicated.

But for some students substituting is itself too complicated!