

A Sample of a Correct Student Work Sample (Allison's Work)



Find the limit $\lim_{x \rightarrow 2} \frac{2x^3 - 4x^2 + 3}{x^2}$

$$\begin{aligned} \lim_{x \rightarrow 2} \frac{2x^3 - 4x^2 + 3}{x^2} \\ &= \frac{2(2)^3 - 4(2)^2 + 3}{(2)^2} \\ &= \frac{2(8) - 4(4) + 3}{4} \\ &= \frac{16 - 16 + 3}{4} \\ &= \boxed{\frac{3}{4}} \end{aligned}$$

- Briefly explain Allison's steps. Do you think Allison's solution is correct?
- From your understanding of what a limit is, does Allison's method make sense? Explain.
- Do you think Allison's method will work every time, or could there be special circumstances that would prevent this method from working? Explain.
- Can you share another way of finding this limit?

After students submitted their responses to these questions, they were shown 3 more avatars revealing various answers to these questions, developed from other student responses.

Then, students were given an opportunity to provide additional comments to Allison.

A Sample of an Incorrect Student Work Sample (Sharon's Work)



Find the limit $\lim_{x \rightarrow 2} \frac{2x^3 - 4x^2 + 3}{x^2}$.

$$\lim_{x \rightarrow 2} \frac{2x^3 - 4x^2 + 3}{x^2} = \lim_{x \rightarrow 2} 2x^3 - 4 + 3$$
$$= \lim_{x \rightarrow 2} 2x^3 - 1 = 2(2)^3 - 1 = 2(8) - 1$$
$$= 16 - 1 = \boxed{15}$$

Uh oh! The answer is supposed to be $\frac{3}{4}$.

- Briefly explain Sharon's steps. Why do you think Sharon's solution is incorrect?
- What would you say to Sharon to help with the problem?
- From your understanding of what a limit is, does Sharon's answer seem reasonable or unreasonable? Explain.
- What specific steps or strategies could Sharon use to avoid this type of error?

After students submitted their responses to these questions, they were shown 3 more avatars revealing various answers to these questions, developed from other student responses.

Then, students were given an opportunity to provide additional comments to Sharon.