Steps for Polynomial Division

\[ \frac{p(x)}{q(x)} \]

1. Write \( q(x) \sqrt{p(x)} \)

2. Divide leading term of numerator by leading term of \( q(x) \). Write answer on top.

3. Multiply answer from 2 and \( q(x) \). Write answer below.

4. Subtract answer from 3 from numerator. Write answer below.

If answer from 4 has smaller degree than \( q(x) \):

**STOP.** Answer from 4 is your remainder. \( \frac{p(x)}{q(x)} \) is sum of terms on top plus \( \frac{\text{remainder}}{q(x)} \).

If answer from 4 has the same or larger degree than \( q(x) \):

Treat answer from 4 as the numerator and repeat 2, 3, 4.

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\[ \frac{10x^2+7x-2}{2x-5} \]

1. \( 2x-5 \overline{10x^2+7x-2} \)

2. \( \frac{10x^2}{2x} = 5x \)

3. \( (5x)(2x-5) = 10x^2 - 25x \)

4. \( \frac{5x}{2x-5} \bar{10x^2+7x-2} \)

5. \( 2x-5 \overline{10x^2+7x-2} \)

6. \( 32x-2 \)

7. \( \frac{32x}{2x} = 16 \)

8. \( 2x-5 \overline{10x^2+7x-2} \)

9. \( - (10x^2-25x) \)

10. \( 32x-2 \)

11. \( 16(2x-5) = 32x-80 \)

12. \( \frac{5x}{2x-5} \bar{10x^2+7x-2} \)

13. \( - (10x^2-25x) \)

14. \( 32x-2 \)

15. \( 32x-80 \)

Answer: \( \frac{10x^2+7x-2}{2x-5} = 5x + 16 + \frac{78}{2x-5} \)