Polynomial Long Division: Steps	Polynomial Long Division: Calculations
1. Original Problem	$(8x^3 + 6x^2 + 11x + 7) \div (2x - 1)$
2. Set up in long division	$2x - 1 \,\overline{\big)\, 8x^3 + 6x^2 + 11x + 7}$
3. Take the first term of the number under the division symbol, and divide it by the first term in the number outside of the division symbol.	$\frac{8x^3}{2x} = 4x^2$
4. Place the resulting quotient from step 3, above the like term on the top of the division symbol.	$\begin{array}{r} 4x^2 \\ 2x - 1 \,\overline{\big)\, 8x^3 + 6x^2 + 11x + 7} \end{array}$
5. Multiply the number that was just placed on top of the division symbol by each of the terms in front of the division symbol. Be mindful of the signs!	$\begin{array}{r} 4x^2 \\ 2x - 1 \,\overline{\big)\, 8x^3 + 6x^2 + 11x + 7} \\ \underline{8x^3 - 4x^2} \end{array}$
6. Subtract the new binomial that was created from the multiplication in step 5. Remember that you can use the additive inverse property and change to addition, as long as you change the signs of each of the numbers that follows.	$\begin{array}{r} 4x^2 \\ 2x - 1 \,\overline{\big)\, 8x^3 + 6x^2 + 11x + 7} \\ \underline{-(8x^3 - 4x^2)} \end{array}$
7. Complete the subtraction	$\begin{array}{r} 4x^2 \\ 2x - 1 \,\overline{\big)\, 8x^3 + 6x^2 + 11x + 7} \\ \underline{-(8x^3 - 4x^2)} \\ +10x^2 \end{array}$
8. Bring the next term down that is under the division symbol.	$\begin{array}{r} 4x^2 \\ 2x - 1 \,\overline{\big)\, 8x^3 + 6x^2 + 11x + 7} \\ \underline{-(8x^3 - 4x^2)} \\ +10x^2 + 11x \end{array}$
9. Repeat steps (3-8) beginning with the first term in the new binomial under the division symbol and the first term in the number outside (to the left) of the division symbol. (step 3)	$\frac{10x^2}{2x} = 5x$

10. Place the resulting quotient from step 9 above the division symbol, next to the resulting number from step 4.	$4x^2 + 5x$ $2x - 1 \ \overline{)\ 8x^3 + 6x^2 + 11x + 7}$ $\underline{-(8x^3 - 4x^2)}$ $+10x^2 + 11x$

11. Multiply the number from step 10 by each of the terms to the left of the division symbol.	$4x^2 + 5x$ $2x - 1 \ \overline{)\ 8x^3 + 6x^2 + 11x + 7}$ $\underline{-(8x^3 - 4x^2)}$ $+10x^2 + 11x$ $\underline{10x^2 - 5x}$
12. Subtract the new binomial that was created from the multiplication in step 5. Remember that you can use the additive inverse property and change to addition, as long as you change the signs of each of the numbers that follows. (repeat step 6)	$4x^2 + 5x$ $2x - 1 \ \overline{)\ 8x^3 + 6x^2 + 11x + 7}$ $\underline{-(8x^3 - 4x^2)}$ $+10x^2 + 11x$ $\underline{-(10x^2 - 5x)}$
13. Complete the subtraction (repeat step 7)	$4x^2 + 5x$ $2x - 1 \ \overline{)\ 8x^3 + 6x^2 + 11x + 7}$ $\underline{-(8x^3 - 4x^2)}$ $+10x^2 + 11x$ $\underline{-(\ 10x^2 - 5x)}$ $+\ 16x$
14. Bring the next term down that is under the division symbol. (repeat step 8)	$4x^2 + 5x$ $2x - 1 \ \overline{)\ 8x^3 + 6x^2 + 11x + 7}$ $\underline{-(8x^3 - 4x^2)}$ $+10x^2 + 11x$ $\underline{-(10x^2 - 5x)}$ $+\ 16x + 7$

15. Repeat steps (3-8) beginning with the first term in the new binomial under the division symbol and the first term in the number outside (to the left) of the division symbol. (step 3)	$\frac{16x}{2x} = 8$
16. Place the resulting quotient from step 15 above the division symbol, next to the resulting number from step 4.	$4x^2 + 5x + 8$ $2x - 1 \;\vert\; 8x^3 + 6x^2 + 11x + 7$ $-(8x^3 - 4x^2)$ $+10x^2 + 11x$ $-(10x^2 - 5x)$ $+16x + 7$
17. Multiply the number from step 16 by each of the terms to the left of the division symbol.	$4x^2 + 5x + 8$ $2x - 1 \;\vert\; 8x^3 + 6x^2 + 11x + 7$ $-(8x^3 - 4x^2)$ $+10x^2 + 11x$ $-(10x^2 - 5x)$ $+16x + 7$ $16x - 8$
18. Subtract the new binomial that was created from the multiplication in step 5. Remember that you can use the additive inverse property and change to addition, as long as you change the signs of each of the numbers that follows.	$4x^2 + 5x + 8$ $2x - 1 \;\vert\; 8x^3 + 6x^2 + 11x + 7$ $-(8x^3 - 4x^2)$ $+10x^2 + 11x$ $-(10x^2 - 5x)$ $+16x + 7$ $-(16x - 8)$

19. Complete the subtraction	$$\begin{array}{r} 4x^2+5x+8 \\ 2x-1 \enclose{longdiv}{8x^3+6x^2+11x+7} \\ -(8x^3-4x^2) \\ +10x^2+11x \\ -(10x^2-5x) \\ +16x+7 \\ -(16x-8) \\ +15 \end{array}$$
20. Keep repeating steps 3 – 8 until there are no more terms to bring down. If there is a number other than 0 at the end of the last subtraction step, you have a remainder. Write the remainder as a fraction to the right of the numbers on top of the division symbol. The top number of the fraction is the last value left after subtraction. And the bottom of the fraction is the expression to the left of the division symbol.	$$\begin{array}{r} 4x^2+5x+8+\frac{15}{(2x-1)} \\ 2x-1 \enclose{longdiv}{8x^3+6x^2+11x+7} \\ -(8x^3-4x^2) \\ +10x^2+11x \\ -(10x^2-5x) \\ +16x+7 \\ -(16x-8) \\ +15 \end{array}$$
21. Final Answer	$$4x^2+5x+8+\frac{15}{(2x-1)}$$