Algebra 2 Name:
Polynomial Division Date:

Solve the following using long division (on this sheet). Think about each step as you do it. **Do not use a calculator!**

1. $284 \div 5$
2. $3479 \div 2$
3. $342875 \div 7$

Polynomial Division

We can divide polynomials similarly to how we divide numbers using long division.

Let's try an example:
$(x^2 + 5x + 6) \div (x + 2) =$??

STEPS

$$\begin{array}{r|l} & * \\ - \ (\qquad\qquad) & * \\ \hline & * \\ \quad - \ (\qquad\qquad) & * \\ \hline \end{array}$$

So…
$(x^2 + 5x + 6) \div (x + 2) =$

Check by multiplying the quotient by $(x + 2)$.

Now something harder…
$(4x^4 - 10x^3 - 11x^2 + 17x - 6) \div (x - 3) =$??

- (   )

- (   )

- (   )

- (   )

So…

$(4x^4 - 10x^3 - 11x^2 + 17x - 6) \div (x - 3) =$

Homework

1. $(x^2 - 4x + 3) \div (x - 1) =$

2. $(2x^2 - 5x - 3) \div (x - 3) =$

3. $(3x^2 + 10x + 8) \div (x + 2) =$

4. $(3x^3 + 2x^2 + 3x + 4) \div (x + 1) =$

5. $(-x^3 + x^2 + 10x - 6) \div (x + 3) =$

6. $(x^4 - 5x^2 + 5x - 6) \div (x - 2) =$

7. What is the quotient and remainder found when dividing $3x^4 - 17x^3 + 9x^2 + 41x + 12$ by $x - 3$?

8. What is the quotient and remainder found when dividing $10x^4 + 11x^3 - 16x^2 - 11x + 6$ by $x - 1$?

9. What is the quotient and remainder found when dividing $-4x^3+6x^2-2x+19$ by $2x-4$?

Answers

1. x-3 2. 2x+1 3. 3x+4 4. $3x^2$-x+4
5. $-x^2$+4x-2 6. x^3+$2x^2$-x+3 7. quotient = $3x^3$-$8x^2$-15x-4 remainder = 0
8. quotient = $10x^{3+}21x^{2+}$5x-6 remainder = 0 9. quotient = $-2x^2$-x-3 remainder =7