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SYNTHETIC DIVISION WORKSHEETS

Use synthetic division for the problems from 1-7 and write the answer of the form $\text{Quotient} + \frac{\text{Remainder}}{\text{Divisor}}$.



1) $(x^3 + 3x^2 - 2x - 5) \div (x + 2)$

2) $(x^3 + 1) \div (x + 1)$

3) $(6x^5 + 13x^4 - 30x^3 - 45x^2 + 12x + 10) \div (2x - 1)$

4) $(x^4 - 6x^3 - 19x^2 + 24x) \div (x - 1)$

5) $(2x^5 + 7x^4 + 3x^3 - 13x^2 - 17x - 6) \div (x + 1)^3$

6) $(8x^4 + 18x^2 + 7x + 1) \div (2x - 1)$

7) $(a^3 + 4) \div (a + 2)$

8) Determine whether $x = 5$ is a zero of the polynomial
 $p(x) = x^3 - 2x^2 - 13x - 10$.

Hint: See whether the remainder when $p(x)$ is divided by $(x - 5)$ is 0.

- 9) The volume of a CD box is $(-6x^3 + 19x^2 - 16x + 4)$ cubic inches. Its height is $(-x + 2)$ inches. Find its base area.



- 10) Prove that $(x - 2)$ and $(x + 1)$ are the factors of $p(x) = 3x^4 - 5x^3 - 5x^2 + 5x + 2$ and find the other factors.

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"Cuemath is a valuable addition to our family. We love solving puzzle cards. My daughter is now visualizing maths and solving problems effectively!"

- Gary Schwartz

"Cuemath is great because my son has a one-on-one interaction with the teacher. The instructor has developed his confidence and I can see progress in his work. One-on-one interaction is perfect and a great bonus."

- Kirk Riley

"I appreciate the effort that miss Nitya puts in to help my daughter understand the best methods and to explain why she got a problem incorrect. She is extremely patient and generous with Miranda."

- Barbara Cabrera

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**ANSWERS**

1)	$x^2 + x - 4 + \frac{3}{x+2}$
2)	$x^2 - x + 1$
3)	$3x^4 + 8x^3 - 11x^2 - 28x - 8 + \frac{2}{2x-1}$
4)	$x^3 - 5x^2 - 24x$
5)	$2x^2 + x - 6$
6)	$4x^3 + 2x^2 + 10x + \frac{17}{2} + \frac{19}{2(2x-1)}$
7)	$a^2 - 2a + 4 - \frac{4}{a+2}$
8)	Yes
9)	$6x^2 - 7x + 2$
10)	(3x + 1) and (x - 1) are the other factors.

FUN FACT

1. If $(x - a)$ is a factor of the polynomial, then $x = a$ is a zero of it.
2. We can use the zeros to factorize a polynomial.
3. The number of linear factors of a polynomial is equal to its degree.

