Key

U2 Day 5 Polynomial and Synthetic Division - HOMEWORK

Use polynomial division to find the quotient and remainder, if any. Remember to add +0x for any missing terms! SHOW ALL work!

1. $x^3 + 2x^2 + x - 3$ ÷ $x - 1$

$x^2 + 3x + 4 + \frac{1}{x-1}$

$-(x^3 - x^2)$

$3x^2 + x$

$-(3x^2 - 3x)$

$4x - 3$

$-(4x - 4)$

1

2. $6x^3 + 2x^2 - 11x + 12$ ÷ $3x + 4$

$2x^2 - 2x - 1 + \frac{16}{3x+4}$

$-(6x^3 + 8x^2)$

$-6x^2 - 11x$

$-(-6x^2 - 8x)$

$-3x + 12$

$-(-3x - 4)$

16

3. $x^3 - 3x^2 + 0x - 10$ ÷ $x - 1$

$x^2 - 2x - 2 - \frac{12}{x-1}$

$-(x^3 - x^2)$

$-2x^2 + 0x$

$-(-2x^2 + 2x)$

$-2x - 10$

$-(-2x + 2)$

-12

Use synthetic division to determine whether the binomial is a factor of ($x^3 + 3x^2 - 10x - 24$). If it is, the remainder will be zero.

4. $(x + 4)$ -4 | 1 3 −10 −24 ; ↓ −4 4 24 ; 1 −1 −6 **(0)** ✓

(Yes) No

5. $(x - 3)$ 3 | 1 3 −10 −24 ; ↓ 3 18 24 ; 1 6 8 **0** ✓

(Yes) No

6. $(x + 6)$ -6 | 1 3 −10 −24 ; ↓ −6 18 −48 ; 1 −3 8 **−72**

Yes (No)

7. $(x + 2)$ -2 | 1 3 −10 −24 ; ↓ −2 −2 24 ; 1 1 −12 **6** ✓

(Yes) No

Synthetic Division. Check the graph to see if your answer is correct: there will be an x-int at the divisor number.

8. $(x^3 + 3x^2 - 10x - 24) \div (x - 3)$

3 | 1 3 −10 −24 ; ↓ 3 18 24 ; 1 6 8 **0**

→ $x^2 + 6x + 8$

9. $(-2x^3 + 15x^2 - 22x - 15) \div (x - 3)$

3 | −2 15 −22 −15 ; ↓ −6 27 15 ; −2 9 5 **0**

→ $-2x^2 + 9x + 5$

10. $(x^3 - 5x^2 - 7x + 25) \div (x - 5)$

5 | 1 −5 −7 25 ; ↓ 5 0 −35 ; 1 0 −7 **10**

→ $x^2 + 7 - \frac{10}{x-5}$

Use Synthetic Division and the Remainder Theorem to find P(a).

11. $P(x) = 3x^3 - 4x^2 - 5x + 1$; $a = 2$

$P(2) = 3(2)^3 - 4(2)^2 - 5(2) + 1 = (-1)$

$P(a) = -1$

12. $P(x) = x^3 + 6x^2 + 10x + 3$; $a = -3$

$P(-3) = (-3)^3 + 6(-3)^2 + 10(-3) + 3 = (0)$

$P(a) = 0$

13. $P(x) = 2x^4 - 9x^3 + 7x^2 - 5x + 11$; $a = 4$

$P(4) = 2(4)^4 - 9(4)^3 + 7(4)^2 - 5(4) + 11 = (39)$

$P(a) = 39$

Use Synthetic Division and the given factor to find the quadratic quotient. Write the quotient as a polynomial.

14. $P(x) = x^3 + 3x^2 - 13x - 15$; $(x - 5)$

5 | 1 3 −13 −15 ; ↓ 5 40 135 ; 1 8 27 **120**

The quotient is $x^2 + 8x + 27 + \frac{120}{x-5}$

15. $P(x) = x^3 - 3x^2 - 10x + 24$; $(x - 2)$

2 | 1 −3 −10 24 ; ↓ 2 −2 −24 ; 1 −1 −12 **0**

The quotient is $x^2 - x - 12$