The Remainder Theorem

MATH MONKS

Use the remainder theorem to find the remainder of each polynomial division. Show your work.

[a] $(-x^3 + 5x^2 + 10x - 12) \div (x + 3)$

The remainder is ▭

[b] $(p^3 + 6p - 2) \div (p - 5)$

The remainder is ▭

[c] $(m^5 - 4m^3 - 6m^2 + 8m + 2) \div (m - 1)$

The remainder is ▭

[d] $(2m^2 + 12m + 16) \div (m + 4)$

The remainder is ▭

[e] $(12b^4 + 8b^3 + 6b^2 + 2b) \div (b + 6)$

The remainder is ▭

[f] $(5v^3 - 11v^2 - 2v + 24) \div (v + 3)$

The remainder is ▭

[g] $(n^3 + n^2 - n - 3) \div (n - 2)$

The remainder is ▭

[h] $(y^3 + 4y - 7) \div (y + 1)$

The remainder is ▭

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Answers

[a] $(-x^3 + 5x^2 + 10x - 12) \div (x + 3)$

$f(-3) = -(-3)^3 + 5(-3)^2 + 10(-3) - 12$

$= 27 + 45 - 30 - 12$

$= 30$

The remainder is 30

[b] $(p^3 + 6p - 2) \div (p - 5)$

$f(5) = (5)^3 + 6(5) - 2$

$= 125 + 30 - 2$

$= 153$

The remainder is 153

[c] $(m^5 - 4m^3 - 6m^2 + 8m + 2) \div (m - 1)$

$f(1) = (1)^5 - 4(1)^3 + 6(1)^2 + 8(1) + 2$

$= 1 - 4 - 6 + 8 + 2$

$= 1$

The remainder is 1

[d] $(2m^2 + 12m + 16) \div (m + 4)$

$f(-4) = 2(-4)^2 + 12(-4) + 16$

$= 32 - 48 + 16$

$= 0$

The remainder is 0

[e] $(12b^4 + 8b^3 + 6b^2 + 2b) \div (b + 6)$

$f(-6) = 12(-6)^4 + 8(-6)^3 + 6(-6)^2 + 2(-6)$

$= 15552 - 1728 + 216 - 12$

$= 14028$

The remainder is 14028

[f] $(5v^3 - 11v^2 - 2v + 24) \div (v + 3)$

$f(-3) = 5(-3)^3 - 11(-3)^2 - 2(-3) + 24$

$= -135 - 99 + 6 + 24$

$= -204$

The remainder is -204

[g] $(n^3 + n^2 - n - 3) \div (n - 2)$

$f(2) = (2)^3 + (2)^2 - (2) - 3$

$= 8 + 4 - 2 - 3$

$= 7$

The remainder is 7

[h] $(y^3 + 4y - 7) \div (y + 1)$

$f(-1) = (-1)^3 + 4(-1) - 7$

$= -1 - 4 - 7$

$= -12$

The remainder is -12