

Math Sheet

Name _____ Score _____ / 12 Teacher _____ Date _____

Remainder Theorem

Evaluate $P(c)$, decide whether $x - c$ is a factor, then divide and state the quotient and remainder.

A. Evaluate using the Remainder Theorem

1. $x^5 - 2x^4 - 2x^3 - x$
Evaluate $P(0)$.

2. $3x^2 - 6x - 2$
Evaluate $P(-1)$.

3. $-3x^3 + 6x^2 + 6x$
Evaluate $P(3)$.

4. $-2x^4 - x + 3$
Evaluate $P(-1)$.

B. Decide whether $x - c$ is a factor

5. $2x^4 + 2x^3 - 4x^2 - 4x + 3$
Is $x - 1$ a factor?

6. $2x^3 - 2x^2 + 4x - 4$
Is $x - 1$ a factor?

7. $x^2 - 3x - 18$
Is $x + 3$ a factor?

8. $-x^5 - 6x^4 - 12x^3 - 8x^2 - 1$
Is $x + 2$ a factor?

C. Divide: write quotient and remainder

9. $-3x^5 - 7x^4 + 2x^3 + x^2 - 7x + 2$
Divide by $x + 1$.

10. $-3x^3 + 2x^2 + 13x - 10$
Divide by $x - 2$.

11. $-2x^4 + x^3 - 5x^2 + 11x - 1$
Divide by $x - 1$.

12. $2x^2 + 3x + 1$
Divide by $x + 1$.

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Remainder Theorem

Answer key

Evaluate $P(c)$, decide whether $x - c$ is a factor, then divide and state the quotient and remainder.

A. Evaluate using the Remainder Theorem

1. $x^5 - 2x^4 - 2x^3 - x$

Evaluate $P(0)$.

$P(0) = 0$

2. $3x^2 - 6x - 2$

Evaluate $P(-1)$.

$P(-1) = 7$

3. $-3x^3 + 6x^2 + 6x$

Evaluate $P(3)$.

$P(3) = -9$

4. $-2x^4 - x + 3$

Evaluate $P(-1)$.

$P(-1) = 2$

B. Decide whether $x - c$ is a factor

5. $2x^4 + 2x^3 - 4x^2 - 4x + 3$

Is $x - 1$ a factor?

No; remainder -1.

6. $2x^3 - 2x^2 + 4x - 4$

Is $x - 1$ a factor?

Yes; remainder 0.

7. $x^2 - 3x - 18$

Is $x + 3$ a factor?

Yes; remainder 0.

8. $-x^5 - 6x^4 - 12x^3 - 8x^2 - 1$

Is $x + 2$ a factor?

No; remainder -1.

C. Divide: write quotient and remainder

9. $-3x^5 - 7x^4 + 2x^3 + x^2 - 7x + 2$

Divide by $x + 1$.

Quotient: $-3x^4 - 4x^3 + 6x^2 - 5x - 2$

Remainder: 4

10. $-3x^3 + 2x^2 + 13x - 10$

Divide by $x - 2$.

Quotient: $-3x^2 - 4x + 5$

Remainder: 0

11. $-2x^4 + x^3 - 5x^2 + 11x - 1$

Divide by $x - 1$.

Quotient: $-2x^3 - x^2 - 6x + 5$

Remainder: 4

12. $2x^2 + 3x + 1$

Divide by $x + 1$.

Quotient: $2x + 1$

Remainder: 0