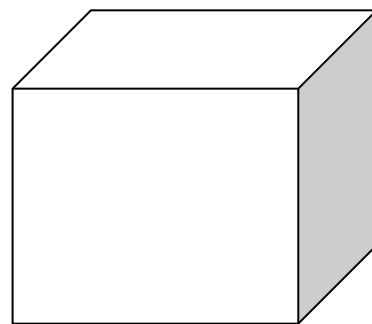


MHF4U: Factor and Remainder Theorems

THINKING and COMMUNICATION 1

1. The volume in cubic, centimetres, of a rectangular box can be modeled by the polynomial expression $2x^3 + x^2 - 27x - 36$. (Note: $V = lwh$, $SA = 2(lw + lh + wh)$) [TH/5]
- A) Determine possible dimensions of the box in terms of " x ". [4]



$$V_{box} = 2x^3 + x^2 - 27x - 36$$

- B) Determine the Surface Area of the box (lid included) if $x = 5\frac{1}{2}$ cm. [1]

2. When $3x^2 + 10x - 3$ is divided by $x + k$, the remainder is 5. Determine all possible values of " k ". [TH/3]

3. (a) When the polynomial $f(x) = ax^3 - x^2 + 2x + b$ is divided by $x - 1$, the remainder is 8. When it is divided by $x - 2$, the remainder is 28. Determine the values of a and b . [TH/4]

(b) Using the values you determined for a and b , determine the quotient and remainder when $f(x)$ is divided by $(x^2 - 2)$. [TH/3]

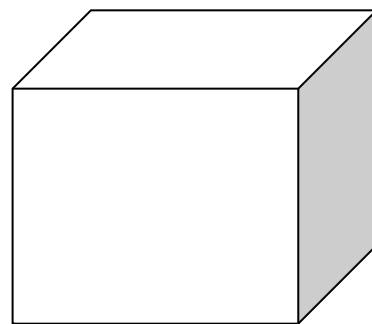
(c) Using a division statement, prove your quotient and remainder are correct. [TH/2]

4. When $6x^3 - 5x^2 + kx - 18$ is divided by $2x - 3$, the remainder is -3. Find the quotient.

MHF4U: Factor and Remainder Theorems

THINKING and COMMUNICATION 2

1. The volume in cubic, centimetres, of a rectangular box can be modeled by the polynomial expression $2x^3 - 3x^2 - 32x - 15$. (Note: $V = lwh$, $SA = 2(lw + lh + wh)$) [TH/5]
- A) Determine possible dimensions of the box in terms of " x ". [4]



$$V_{box} = 2x^3 - 3x^2 - 32x - 15$$

- B) Determine the Surface Area of the box (lid included) if $x = 8\frac{1}{2}$ cm. [1]

2. When $3x^2 + 10x - 2$ is divided by $x + k$, the remainder is -5. Determine all possible values of " k ". [TH/3]

3. (a) When the polynomial $f(x) = ax^3 - x^2 + 2x + b$ is divided by $x - 1$, the remainder is 8. When it is divided by $x + 1$, the remainder is -4 . Determine the values of a and b . [TH/4]

(b) Using the values you determined for a and b , determine the quotient and remainder when $f(x)$ is divided by $(x^2 - 3)$. [TH/3]

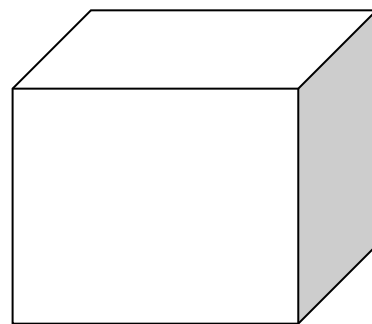
(c) Using a division statement, prove your quotient and remainder are correct. [TH/2]

4. When $4x^3 - 12x^2 + kx - 7$ is divided by $2x - 3$, the remainder is -4 . Find the quotient.

MHF4U: Factor and Remainder Theorems

THINKING and COMMUNICATION 3

1. The volume in cubic, centimetres, of a rectangular box can be modeled by the polynomial expression $2x^3 + 3x^2 - 29x - 60$. (Note: $V = lwh$, $SA = 2(lw + lh + wh)$) [TH/5]
- A) Determine possible dimensions of the box in terms of " x ". [4]



$$V_{box} = 2x^3 + 3x^2 - 29x - 60$$

- B) Determine the Surface Area of the box (lid included) if $x = 8\frac{1}{2}$ cm. [1]

2. When $5x^2 + 13x - 2$ is divided by $x + k$, the remainder is 4. Determine all possible values of " k ". [TH/3]

3. (a) When the polynomial $f(x) = ax^3 - x^2 + 2x + b$ is divided by $x - 1$, the remainder is 14. When it is divided by $x - 2$, the remainder is 69. Determine the values of a and b . [TH/4]

(b) Using the values you determined for a and b , determine the quotient and remainder when $f(x)$ is divided by $(x^2 - 1)$. [TH/3]

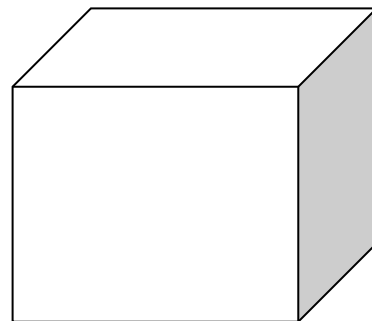
(c) Using a division statement, prove your quotient and remainder are correct. [TH/2]

4. When $10x^3 - 17x^2 + kx - 7$ is divided by $2x - 3$, the remainder is -1. Find the quotient.

MHF4U: Factor and Remainder Theorems

THINKING and COMMUNICATION 4

1. The volume in cubic, centimetres, of a rectangular box can be modeled by the polynomial expression $2x^3 - x^2 - 36x - 45$. (Note: $V = lwh$, $SA = 2(lw + lh + wh)$) [TH/5]
- A) Determine possible dimensions of the box in terms of " x ". [4]



$$V_{box} = 2x^3 - x^2 - 36x - 45$$

- B) Determine the Surface Area of the box (lid included) if $x = 9\frac{1}{2}$ cm. [1]

2. When $2x^2 - 3x - 23$ is divided by $x + k$, the remainder is -3. Determine all possible values of " k ". [TH/3]

3. (a) When the polynomial $f(x) = ax^3 - x^2 + 2x + b$ is divided by $x - 1$, the remainder is 2. When it is divided by $x + 2$, the remainder is -52 . Determine the values of a and b . [TH/4]

(b) Using the values you determined for a and b , determine the quotient and remainder when $f(x)$ is divided by $(x^2 - 2)$. [TH/3]

(c) Using a division statement, prove your quotient and remainder are correct. [TH/2]

4. When $8x^3 - 8x^2 + kx - 9$ is divided by $2x - 3$, the remainder is -6 . Find the quotient.