

MEMORANDUM

REMAINDER THEOREM EXERCISES

Use the remainder theorem to calculate the remainder in each of the following cases:

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$$1) \frac{2x^3 - 4x^2 + 6x - 12}{x + 3}$$

$$x + 3 = 0$$

$$x = -3$$

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

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

$$f(-3) = 2(-27) - 4(9) - 18 - 12$$

$$f(-3) = -120$$

$$\therefore \text{Remainder} = -120$$

$$2) \frac{4x^3 - 12x^2 + 4}{2x + 3}$$

$$2x + 3 = 0$$

$$\frac{2x}{2} = -\frac{3}{2}$$

$$x = -\frac{3}{2}$$

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

$$f\left(-\frac{3}{2}\right) = 4\left(-\frac{3}{2}\right)^3 - 12\left(-\frac{3}{2}\right)^2 + 4$$

$$f\left(-\frac{3}{2}\right) = -\frac{73}{2}$$

$$\therefore \text{Remainder} = -\frac{73}{2}$$

$$3) \frac{6x^3 - 2x^2 + 4x - 4}{3x + 6}$$

$$3x + 6 = 0$$

$$\frac{3x}{3} = -\frac{6}{3}$$

$$x = -2$$

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

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

$$f(-2) = -68$$

$$\therefore \text{Remainder} = -68$$