



MATHS101

Calculus I

Lesson (1)

Functions & Factoring

أوقات الدروس

LIVE

السبت

الجمعة

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يوم السبت

26/09/2026

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أ. الحوراء محمد

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رابط الاليف والدروس

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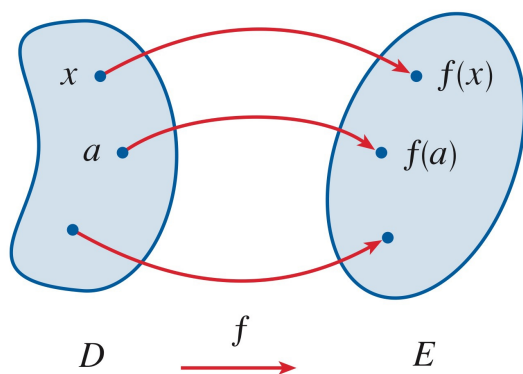
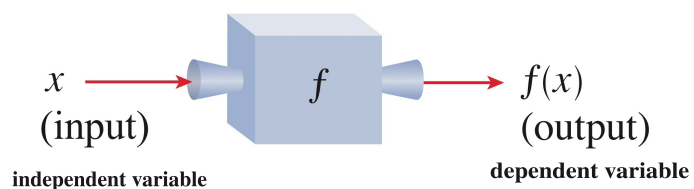
انضم الآن
لمجموعة الواتساب



سجل الآن
عبر موقعنا

■ Functions

A **function** f is a rule that assigns to each element x in a set D exactly one element, called $f(x)$, in a set E .



Constant and Linear Functions

Constant Function:

$f(x) = C$

Linear Function:

$f(x) = ax + b$

Find the value of x

a) $7 - 4x = 3$

b) $\frac{6 + 3(x - 5)}{2} = \frac{4x}{3}$

Factoring

a) $(2x + 3)^2$

b) $x^2 - 5$

c) $x^2 - 9$

Algebraic Formulas

$(a - b)^2 = a^2 - 2ab + b^2$
$(a + b)^2 = a^2 + 2ab + b^2$
$a^2 - b^2 = (a + b)(a - b)$
$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$
$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$
$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$
$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$
$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac$

d) $x^4 - 16$

Quadratic Equation

The general form of a quadratic equation is

$$ax^2 + bx + c = 0$$

Solve:

a) $x^2 - 3x = -2$

b) $6x^2 - 17x = -12$

Logarithmic Function

The logarithmic form and exponential form are related by

$$\log_b x = y \quad \Longleftrightarrow \quad b^y = x$$

Logarithmic Properties:

If x and y are positive, then

$$\log_b(xy) = \log_b x + \log_b y$$

$$\log_b \left(\frac{x}{y} \right) = \log_b x - \log_b y$$

$$\log_b(x^r) = r \log_b x$$

Solve:

a) $\log_2 16 = y$

b) $\log_3 8 = y$

Natural Logarithm

The logarithm with base e is called the **natural logarithm** and is denoted by $\ln$.

$$e \approx 2.718$$

$$\log_e x = \ln x$$

$$e^{\ln x} = x$$

Find the value of x

a) $e^{3-4x} = 12$

b) $e^{e^{2x}} = 3$

EXAMPLE 1 The graph of a function f is shown in Figure 6.

- (a) Find the values of $f(1)$ and $f(5)$.
- (b) What are the domain and range of f ?

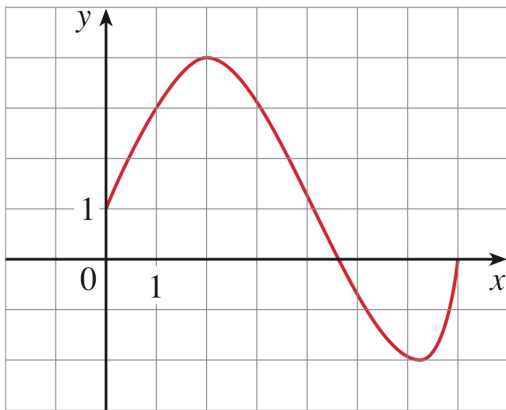


FIGURE 6