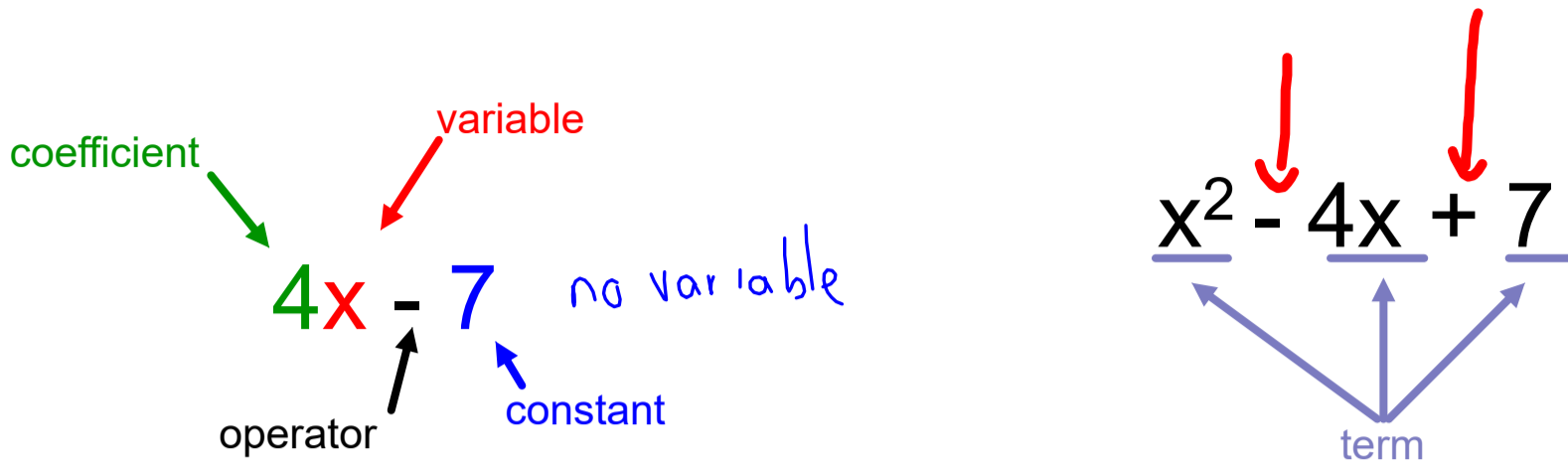


Vision 4.1

A polynomial is an algebraic expression composed of one or more terms.



Polynomials have different names depending on the number of terms they contain.

A function whose rule includes a polynomial is called a polynomial function.

Polynomial	Number of terms	Name
$5x$	1	Monomial
$6x - 1$	2	Binomial
$x^2 - 4x + 7$	3	Trinomial

Trinomials

Examples

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

$$x^{100} + 7x^{10} + x$$

Non-examples

$$6x - 1$$

$$5x \quad 7$$

$$-368x$$

$$6669x$$

$$x^7 + x^6 + x^5 + x^4 + x^3 + x^2 + x + 1$$

The degree of a polynomial function

examples of a polynomial function of degree 2

$$x^2$$

$$2x^2 + x + 1$$

$$4x^2 + 7$$

non - examples of a polynomial function of degree 2

$$x^3$$

$$x$$

$$x^5 + x^4 + x^3 + x^2 + x + 1$$

$$x^7 + 2x^2$$

What is a possible definition for the degree of a polynomial function?

The degree of a polynomial functions corresponds to its largest exponent

Polynomial Function of Degree 0

A constant function where a variation in the independent variable produces no variation in the dependent variable.

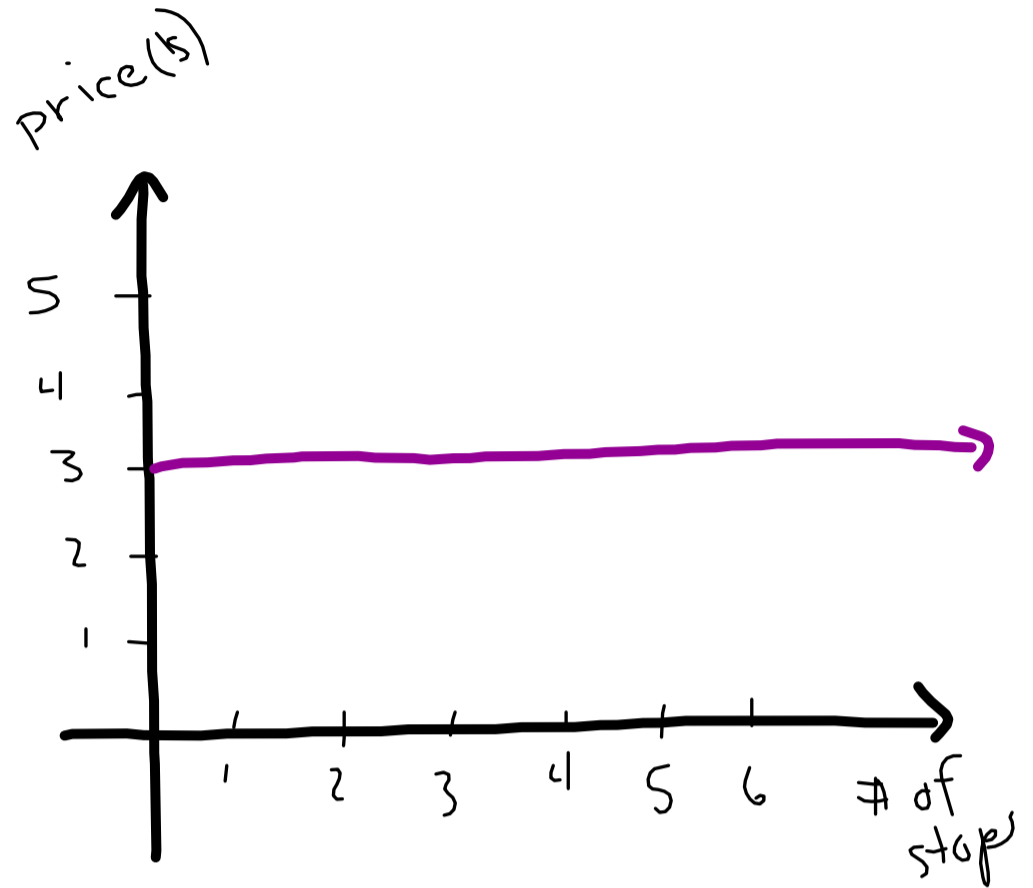
The rule of a polynomial function of degree 0 is expressed as $f(x) = b$ or $y = b$, where b is a constant.

Example:

The price of a bus ride is \$3 regardless on the number of stops the bus makes.

# of stops	price of bus ride
1	\$3
2	\$3
3	\$3
4	\$3

Handwritten annotations: Red arrows labeled '+1' point from the number of stops to the next row. Red brackets labeled '+0' connect the price values (\$3) across rows. A purple arrow labeled '+0' points from the price value for 4 stops to the price value for 3 stops.



$$y = 3 \quad \text{or} \quad f(x) = 3$$

Polynomial Function of Degree 1

→ straight line

A polynomial function of degree 1 is a linear function where a constant variation in the independent variables produces a constant non-zero variation in the dependent variable.

A polynomial function of degree 1 is called a **direct-variation function**. Graphically, the line passes through the origin.

Example:

$$C = 2\pi r$$

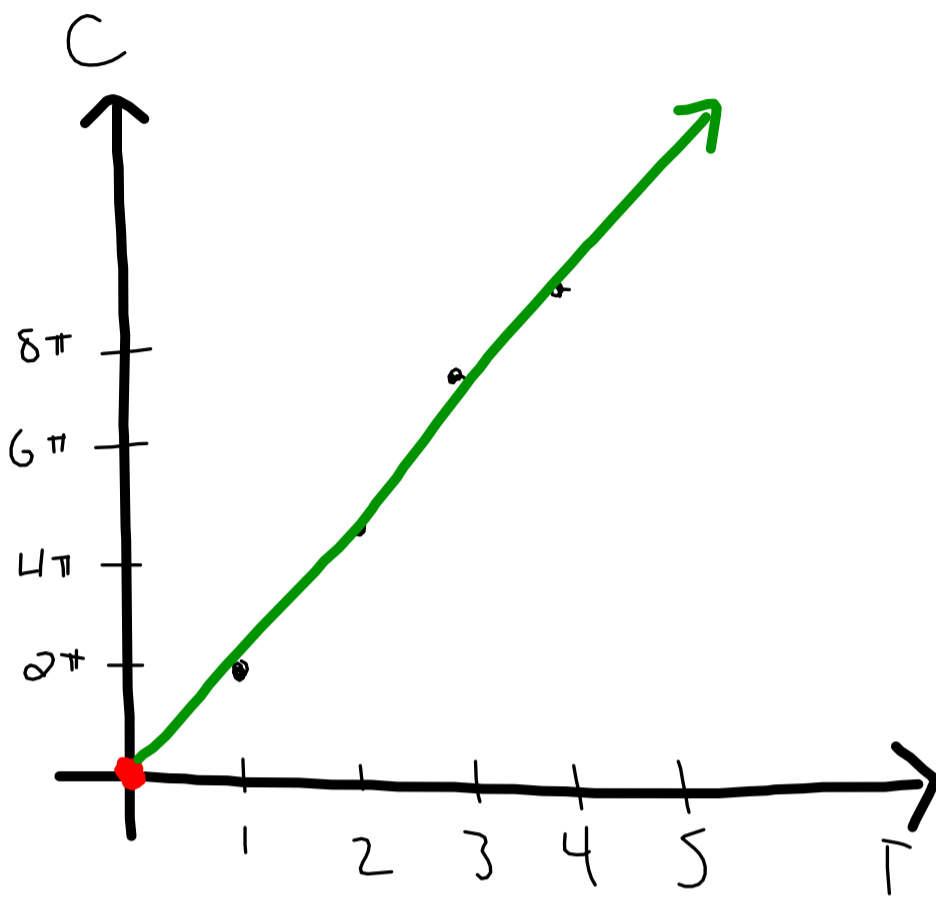
The circumference of a circle is dependent on the radius of the circle.

ind = radius

dep = circumference

radius	circumference
0	0
1	$2\pi(1) = 2\pi$
2	$2\pi(2) = 4\pi$
3	6π
4	8π

Handwritten annotations show a constant increase of $+2\pi$ in circumference for each unit increase in radius.



A polynomial function of degree 1 is called a **partial-variation function** if it has a non-zero value.

Graphically, the line does not pass through the origin.

Example:

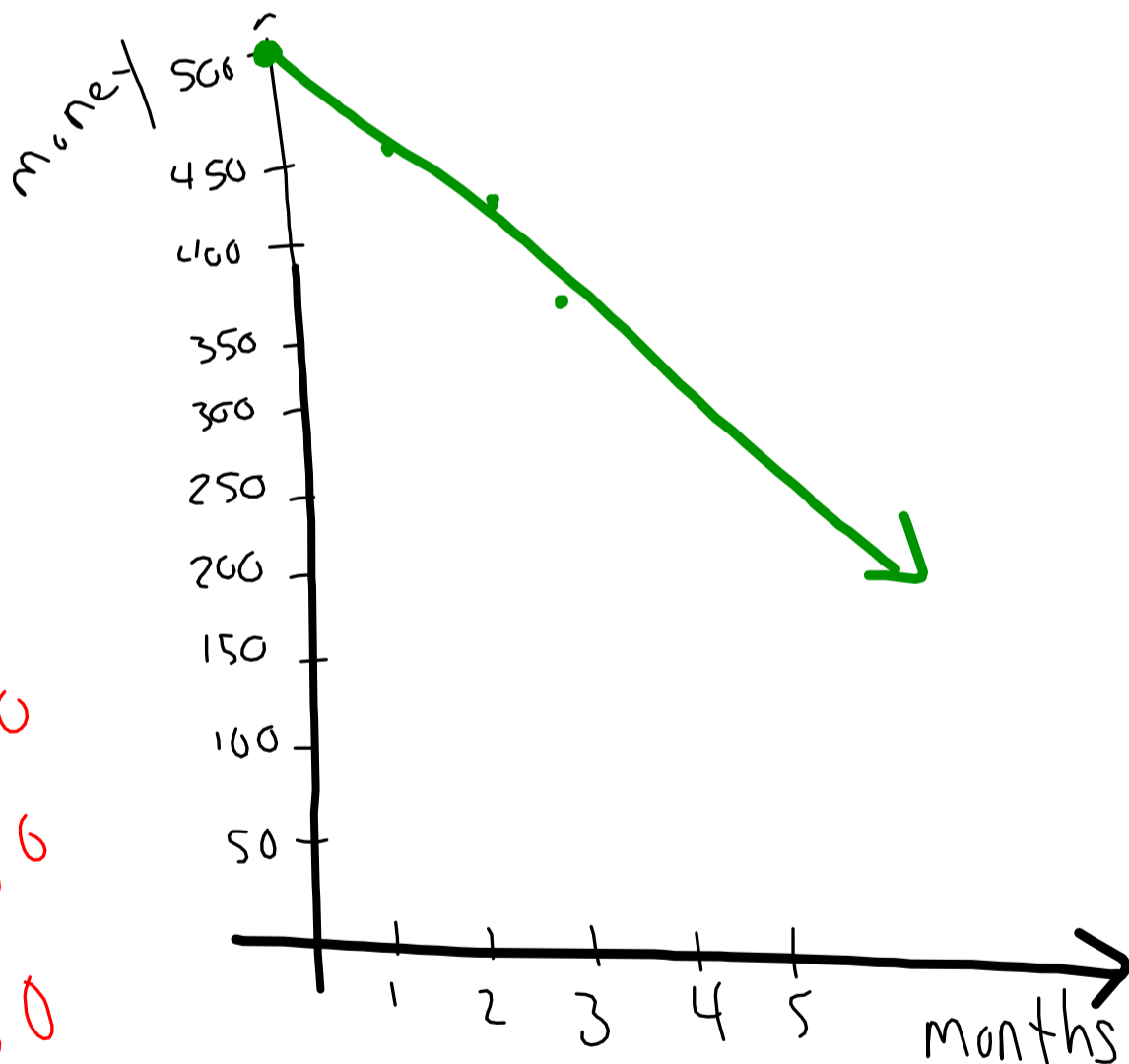
Mathew's bank account has \$500. Each month Mathew spends \$50.

ind = # of months

dep - value of bank

# of months	money in the bank (\$)
0	500
1	450
2	400
3	350

Handwritten annotations show a constant decrease of -50 in money for each unit increase in months.



Check Your Understanding

Textbook volume 1 pg. 176

Questions 1, 2, 4, and 6

