Section 2.1 Linear Functions

Examples

1) Write and graph the linear function $f(x)$ for which $f(-2)=5$ and $f(4)=-4$.

Average Rate of Change of a function $y=f(x)$ between x = a and x = b where a is not equal to b is given by

$$\frac{f(b)-f(a)}{b-a}$$

In other words,

(change in the output values)/(change in the input values)

In a linear function, the rate of change is constant and is equivalent to the slope of the line.

Modeling Depreciation with a Linear Function

2) Camelot Apartments bought a $50,000 building and for tax purposes are depreciating it $2000 per year over a 25-year period using straight-line depreciation.

a) What is the rate of change of the value of the building?

b) Write an equation for the value v(*t*) of the building as a linear function of the time *t* since the building was placed in service.

c) Evaluate v(0) and v(16)

d) Solve v(t)= 39,000

Section 2.1 Quadratic Functions

Standard form of a Quadratic Equation $f(x) = ax^2 + bx + c$

y-intercept (0,c)

Vertex form of a Quadratic Equation $f(x) = a(x-h)^2 + k$

Vertex (h,k)

Factored form of a Quadratic Equation $f(x) = a(x-m)(x-n)$

Zeros x=m and x=n

Examples

1) Find the vertex and axis of the graph of the function. Rewrite the equation in vertex form.

$f(x) = 8x - x^2 + 3$

2) Use completing the square to describe the graph of each function. Support your answer graphically.

$f(x) = 10 - 16x - x^2$

3) Write an equation of for the quadratic function whose vertex is (-5, 13) and that passes through the point (-2, 22).