Practice Exercises

Sketch the graph of each polynomial function.

1. $f(x) = (x-2)(x+1)$
2. $f(x) = (x-2)(x+1)(x+3)$
3. $f(x) = (x-2)^2(x+2)^2$
4. $f(x) = x^4 - 2x^3 - 3x^2 + 4x + 4$
5. $f(x) = -x^3 - 9x^2 - 27x - 27$

Problem Set

Sketch the graph of each polynomial function.

1. $f(x) = (x-2)(x-1)(x-3)$
2. $f(x) = x(x+1)^2$
3. $f(x) = x(x-2)(x+1)(x+3)$
4. $f(x) = (x+2)(x-1)(x-3)^2$

Problem Set

1. $a_n : +$, $n = 3(odd)$, Case 1

$0 = (x-2)(x-1)(x-3)$

$x-2=0$

$x=2$

$x-1=0$

$x=1$

$x-3=0$

$x=3$

$Roots = \{1,2,3\}$

2. $a_n : +$, $n = 3(odd)$, Case 1

$0 = x(x+1)^2$

$x=0$

$(x+1)^2=0$

$\sqrt{(x+1)^2} = \sqrt{0}$

$x+1=0$

$x=-1$ of mult. 2

Roots={0, -1 of mult. 2}

3. $a_n = +$, $n = 4(even)$, Case 3

$0 = x(x-2)(x+1)(x+3)$

$x=0$

$x-2=0$

$x=2$

$x+1=0$

$x=-1$

$x+3=0$

$x=-3$

$Roots = \{-3,-1,0,2\}$

If $x=-2$:

$f(-2) = -2(-2-2)(-2+1)(-2+3)$

$f(-2) = -2(-4)(-1)(1)$

$f(-2) = -8$

$\therefore (-2, -8)$

If $x = 1$:

$f(1) = 1(1-2)(1+1)(1+3)$

$f(1) = 1(-1)(2)(4)$

$f(1) = -8$

$\therefore (1, -8)$

$0 = (x+2)(x-1)(x-3)^2$

$x+2 = 0$

$x = -2$

$x-1 = 0$

$x = 1$

$(x-3)^2 = 0$

$\sqrt{(x-3)^2} = \sqrt{0}$

$x-3 = 0$

$x = 3$ of mult. 2

4. $a_n = +$, $n = 4(even)$, Case 3 Roots={-2, 1, 3 of mult. 2}