**3.4 – EQUATIONS AND GRAPHS OF POLYNOMIAL FUNCTIONS**

Sometimes a polynomial has a factor $(x-a)$ repeated several times.

Example: $P\left(x\right)=\left(x-3\right)^{2}(x+1)$

The number of times the factor $(x-a)$ is repeated is called the **multiplicity** of the zero $x=a$.

Example: $P\left(x\right)=\left(x-3\right)^{2}(x+1)$ has a zero multiplicity 2 at $x=3$ and a zero multiplicity 1 at $x=-1$.

**Effect on a graph:**



Note: When the multiplicity is odd, the sign of the function changes there.

 When the multiplicity is even, it doesn’t.

**Getting Info from a graph:**

Example 1 p 138



Your turn p 139



**Getting Info from Equations:**

Example 2 p 140



a) b) c)

  

Your turn p 142



**Hwk: p 147 # 1 – 10, 12 – 16.**