Page 349 Excercise Set (11-40) all

(12) Not a polynomial (sharp turn)

(14) Polynomial

(16) Power: odd Leading Coefficient: positive

as $x \to -\infty$, $f(x) \to -\infty$

as $x \to \infty$, $f(x) \to \infty$

matches graph c.

(18) Power: odd Leading Coefficient: negative

as $x \to -\infty$, $f(x) \to \infty$

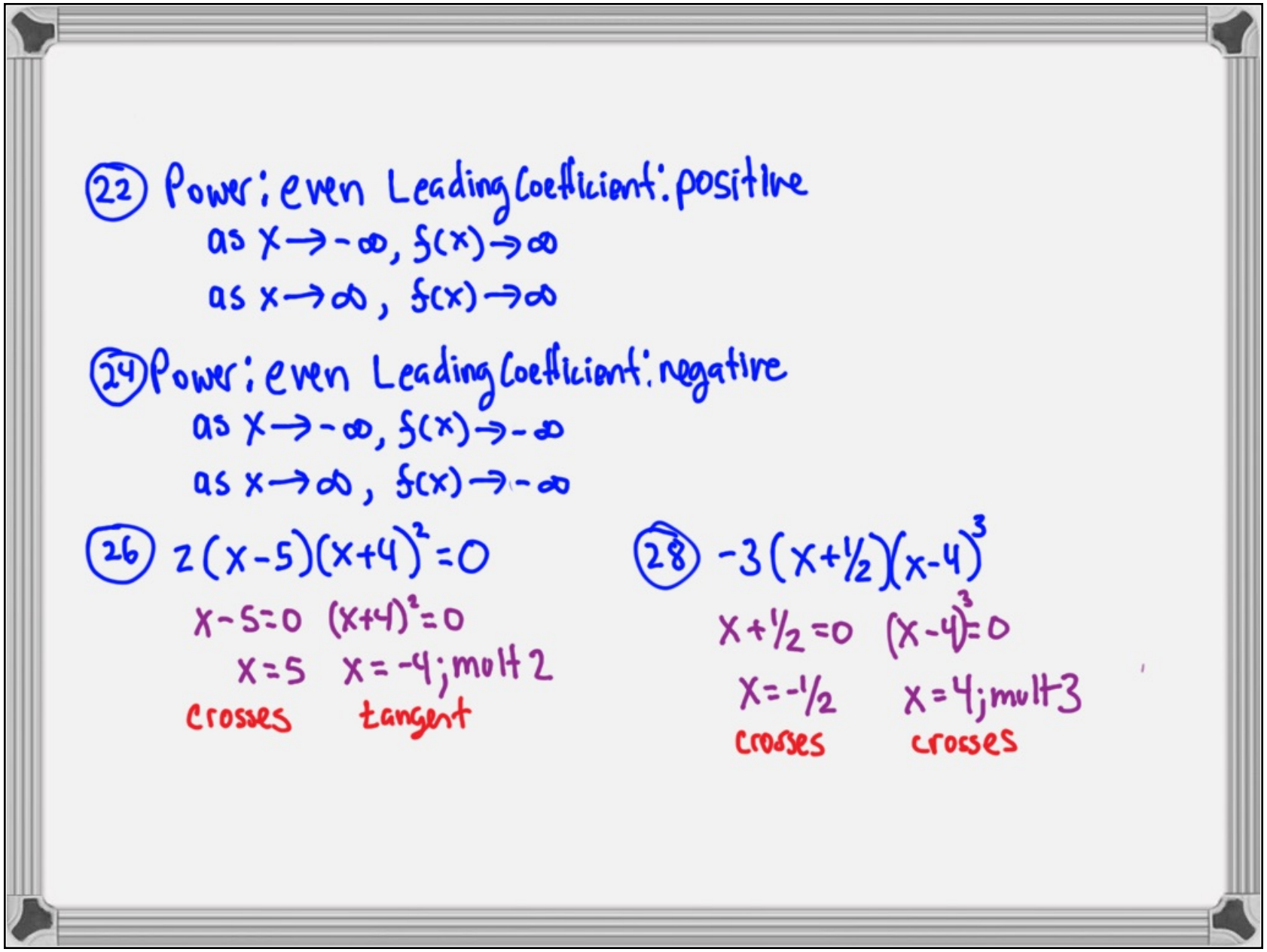
as $x \to \infty$, $f(x) \to -\infty$

matches graph d.

(20) Power: odd Leading Coefficient: positive

as $x \to -\infty$, $f(x) \to -\infty$

as $x \to \infty$, $f(x) \to \infty$


(22) Power; even Leading Coefficient: positive
as $x \to -\infty$, $f(x) \to \infty$
as $x \to \infty$, $f(x) \to \infty$
(24) Power; even Leading Coefficient: negative
as $x \to -\infty$, $f(x) \to -\infty$
as $x \to \infty$, $f(x) \to -\infty$
(26) $2(x-5)(x+4)^2 = 0$
$x-5=0$ $(x+4)^2=0$
$x=5$ $x=-4$; mult 2
crosses tangent
(28) $-3(x+\frac{1}{2})(x-4)^3$
$x+\frac{1}{2}=0$ $(x-4)^3=0$
$x=-\frac{1}{2}$ $x=4$; mult 3
crosses crosses

(30) $x^3+4x^2+4x=0$

$x(x^2+4x+4)=0$

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

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

$x=0 \quad (x+2)^2=0$

$x=0 \quad x=-2$; mult 2

crosses tangent

(32) $x^3+5x^2-9x-45=0$

$(x^3+5x^2)(-9x-45)=0$

$x^2(x+5)-9(x+5)=0$

$(x+5)(x^2-9)=0$

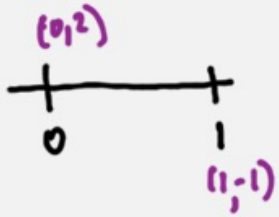
$(x+5)(x-3)(x+3)=0$

$x=-5 \quad x=3 \quad x=-3$

crosses crosses crosses

(34) $f(0)=2$

$f(1)=-1$

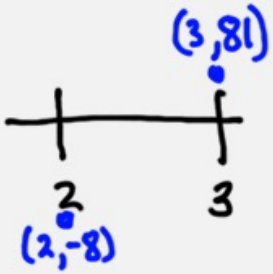


Since $f(x)$ is continuous on the interval $(0,1)$ and $f(1) < f(c) < f(0)$ there exists at least one value "c" such that $f(c)=0$ on the interval by the IVT.

($f(1)=-1$, $f(c)=0$, $f(0)=2$)

(36) $f(2)=-8$

$f(3)=81$

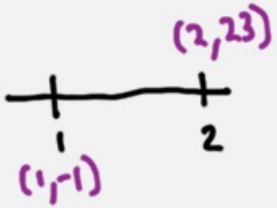


Since $f(x)$ is continuous on the interval $(2,3)$ and $f(2) < f(c) < f(3)$ there exists at least one value "c" such that $f(c)=0$ on the interval by the IVT.

($f(2)=-8$, $f(c)=0$, $f(3)=81$)

(38) $f(1) = -1$

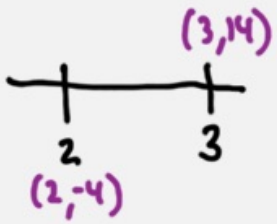
$f(2) = 23$



Since $f(x)$ is continuous on the interval $(1,2)$ and $f(1) < f(c) < f(2)$ there
$-1 \quad 0 \quad 23$
exists at least one value "c" such that $f(c)=0$ on the interval by the IVT.

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

$f(3) = 14$



Since $f(x)$ is continuous on the interval $(2,3)$ and $f(2) < f(c) < f(3)$ there
$-4 \quad 0 \quad 14$
exists at least one value "c" such that $f(c)=0$ on the interval by the IVT.