(22) $x+3 \overline{)3x^3+10x^2-x-12}$

$3x^2+7x-22$

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

$7x^2-x$

$-7x^2+21x$

$-22x-12$

$-(-22x-66)$

54

$3x^2(x+3)$

$3x^3+3x^2$

$7x(x+3)$

$7x^2+21x$

$-22(x+3)$

$-22x-66$

$x+3$ is not a factor of the dividend because when you divide, you get a remainder of 54

(23) $x-1 \overline{)3x^3+10x^2-x-12}$

$3x^2+13x+12$

$-3x^3-3x^2$

$13x^2-x$

$-13x^2-13x$

$12x-12$

$-12x-12$

0

$3x^2(x-1)$

$3x^3-3x^2$

$13x(x-1)$

$13x^2-13x$

$12(x-1)$

$12x-12$

Yes, $x-1$ is a factor of $3x^3+10x^2-x-12$ because when you divide, you get a remainder of zero.

(24) $x+2 \overline{)3x^3+10x^2-x-12}$

$3x^2+4x-9$

$-3x^3+6x^2$

$4x^2-x$

$-4x^2+8x$

$-9x-12$

$-(-9x-18)$

6

$3x^2(x+2)$

$3x^3+6x^2$

$4x(x+2)$

$4x^2+8x$

$-9(x+2)$

$-9x-18$

$x+2$ is not a factor of the dividend because you get a 6 as a remainder when you divide

(25) $x-4 \overline{)3x^3+10x^2-x-12}$

$3x^2+22x+87$

$-3x^3-12x^2$

$22x^2-x$

$-22x^2-88x$

$87x-12$

$-(87x-348)$

360

$3x^2(x-4)$

$3x^3-12x^2$

$22x(x-4)$

$22x^2-88x$

$87(x-4)$

$87x-348$

$x-4$ is not a factor of $3x^3+10x^2-x-12$ because you get 360 as a remainder when you divide

(26) $y=-1(x+3)(x+2)(x-1)$

(27) $y=x^2(x-1)(x+2)^2$

(28) $y=x^2(x-3)^2$

(29) $y=-1(x+1)(x+3)(x-1)^2$

(30) $f(x)=x^3$ has a +, n odd, so EB is $\swarrow\nearrow$ it's the second one

$g(x)=-x^4$ has a −, n even $\nwarrow\searrow$, which is the 1st graph

$h(x)=-x^3$ has a −, n odd, w/ EB $\nwarrow\searrow$ which is the last graph

$j(x)=x^2$ a +, n even, which is $\nwarrow\nearrow$, so it's graph #3