

Factor each of the following polynomial expressions. Then use the end behavior, multiplicity and y-intercept to sketch a Graph.

1) $f(x) = (x^3 - 5x^2)(9x + 45)$
 $f(x) = x^2(x-5) \cdot 9(x+5)$
 $(x^2 - 9)(x+5)$
 $(x+3)(x-3)(x+5)$

a) x-int (2cross) y-int (0, 45)
 $x = -3, 3, 5$

b) $D = 3$
 $x \rightarrow \infty, y \rightarrow \infty$
 $x \rightarrow -\infty, y \rightarrow -\infty$

c) $x = -3$ $x = 3$ $x = 5$
 mult 1 mult 1 mult 1

d) Graph on Back

2) $f(x) = x^3 + 2x^2 - 15x$
 $f(x) = x(x^2 + 2x - 15)$
 $= x(x-5)(x+3)$

a) 2cross
 $x = 0$ $x = 5$ $x = -3$ y-int (0, 0)

b) $D = 3$ $x \rightarrow \infty, y \rightarrow \infty$
 $x \rightarrow -\infty, y \rightarrow -\infty$

c) $x = 0$ $x = 5$ $x = -3$
 mult 1 mult 1 mult 1

3) $f(x) = x^4 - 29x^2 + 100$

$(x^2 - 25)(x^2 - 4)$
 $(x-5)(x+5)(x-2)(x+2)$

a) 2cross
 $x = \pm 5, \pm 2$ y-int (0, 100)

b) $D = 4$
 $x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow \infty$

c) $x = 5$ $x = -5$ $x = 2$ $x = -2$
 mult 1 mult 1 mult 1 mult 1

d) Graph on Back

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

a) Find the x-intercepts and the y-intercept of the function

b) Determine the degree of the function and the end behavior.

c) Determine the multiplicity at each zero of the function.

d) Sketch the graph of the function.

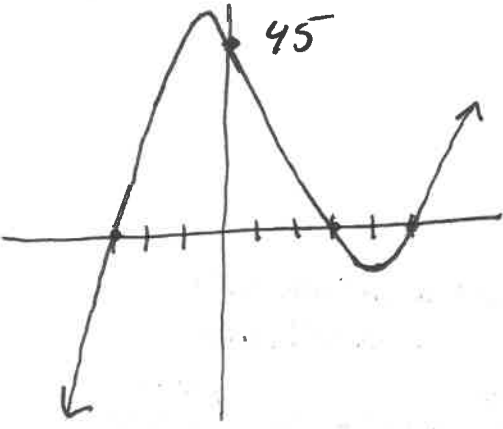
4) a) 2cross
 $x = -5$ $x = -2$ $x = 3$
 y-inter (0, -150)

b) $D = 4$
 $x \rightarrow \infty, y \rightarrow \infty$
 $x \rightarrow -\infty, y \rightarrow \infty$

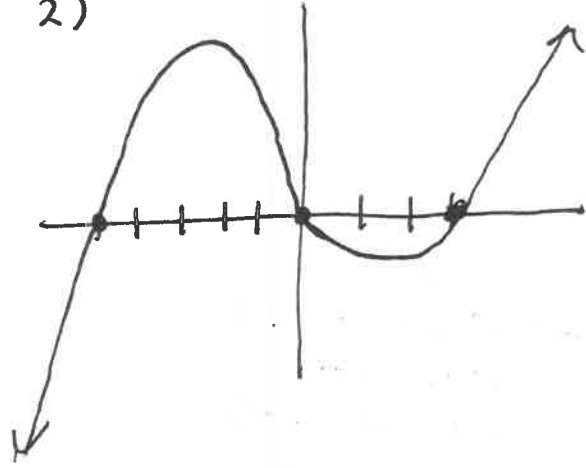
c) $x = -5$ $x = -2$ $x = 3$
 mult 2 mult 1 mult 1

d)

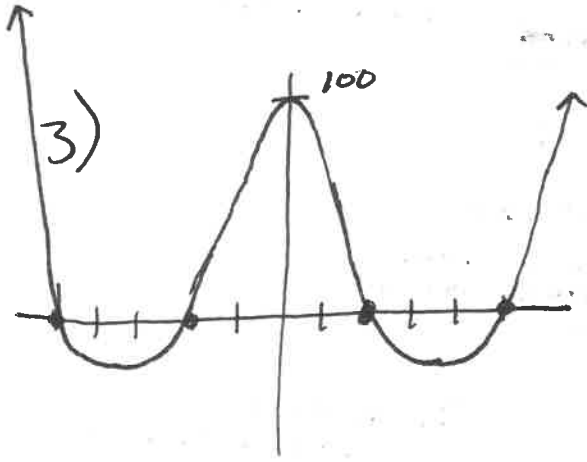
1)



2)



3)



4)

