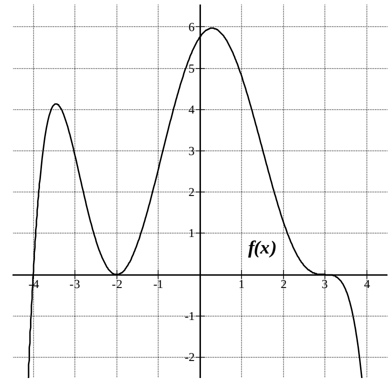
PREC12
Quiz3.4(F)

Name KEY
NO CALCULATORS

1. For the graph of $f(x)$ shown state:



a) the zeros of the function and the minimum multiplicity of each zero.

zero	multiplicity
-4	1
-2	2
3	3

b) the minimum degree of the function

6

c) a possible factored equation of the function

$y = -(x+4)(x+2)^2(x-3)^3$

* There is some vertical compression factor

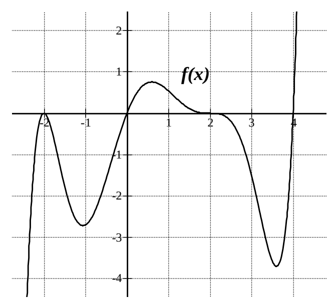
d) intervals for which $f(x) < 0$

$x < -4$; $x > 3$

e) intervals for which $f(x) > 0$

$-4 < x < -2$; $-2 < x < 3$

2. For the graph of $f(x)$ shown state:



a) the zeros of the function and the minimum multiplicity of each zero.

zero	multiplicity
-2	2
0	1
2	3
4	1

b) the minimum degree of the function

7

c) a possible factored equation of the function

$y = x(x+2)^2(x-2)^3(x-4)$

d) intervals for which $f(x) < 0$

$x < -2$; $-2 < x < 0$; $+2 < x < 4$

e) intervals for which $f(x) > 0$

$0 < x < 2$; $x > 4$

3. Sketch the graph of each polynomial function:

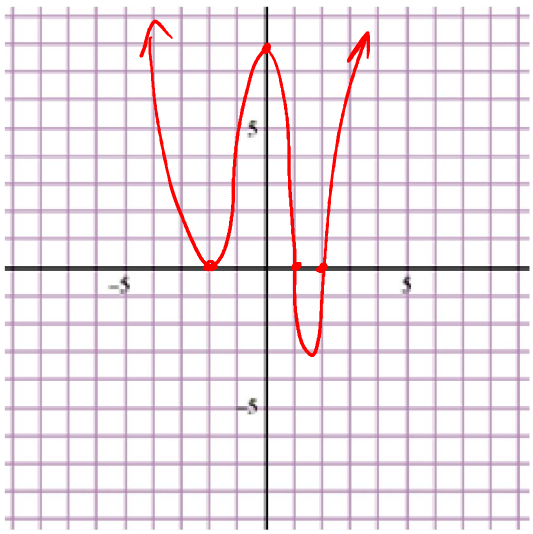
a) $y = (x + 2)^2(x - 1)(x - 2)$

Zero	multiplicity
-2	2
1	1
2	1

Degree 4

y-int $= 2^2(-1)(-2) = 8$

↑ Q II + ↑ Q I



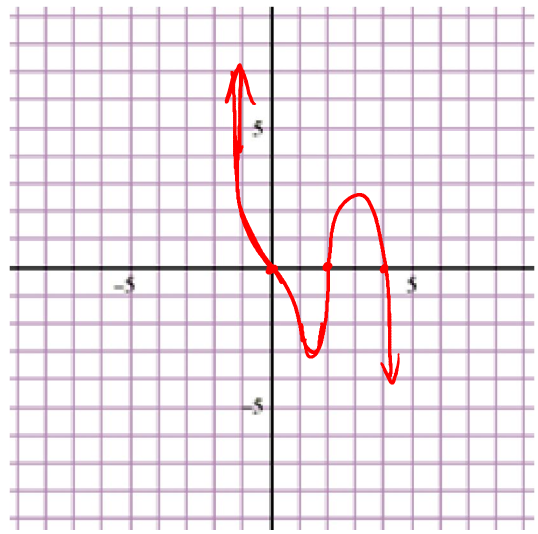
b) $y = -x^3(x - 2)(x - 4)$

zero	multiplicity
0	3
2	1
4	1

D = 5

y-int = 0

↑ Q I + ↓ Q IV



c) $y = x^5 - 3x^4 - x^3 + 7x^2 - 4$ $= (x-1)(x+1)^2(x-2)^2$

$\pm 1, 2, 4$

$P(1) = 0 \therefore x-1$ factor

$$\begin{array}{r|rrrrrr} 1 & 1 & -3 & -1 & 7 & 0 & -4 \\ & \downarrow & 1 & -2 & -3 & 4 & 4 \\ \hline & 1 & -2 & -3 & 4 & 4 & 0 \end{array}$$

$x^4 - 2x^3 - 3x^2 + 4x + 4$

$\pm 1, 2, 4$

$P(-1) = 0$ $(x+1)$ factor

$$\begin{array}{r|rrrrr} -1 & 1 & -2 & -3 & 4 & 4 \\ & \downarrow & -1 & 3 & 0 & -4 \\ \hline & 1 & -3 & 0 & 4 & 0 \end{array}$$

$x^3 - 3x^2 + 4$

$\pm 1, 2, 4$

$P(-1) = 0$ $(x+1)$ factor

$$\begin{array}{r|rrrr} -1 & 1 & -3 & 0 & 4 \\ & \downarrow & -1 & 4 & -4 \\ \hline & 1 & -4 & 4 & 0 \end{array}$$

$x^2 - 4x + 4$

$= (x-2)(x-2)$

zero	multiplicity
1	2
-1	1
2	2

D = 5

y-int $= -1(1)^2(-2)^2$
$= -4$

↓ Q III ↑ Q I