

Name _____
Mr. Schlansky

Date _____
Algebra II

Intervals

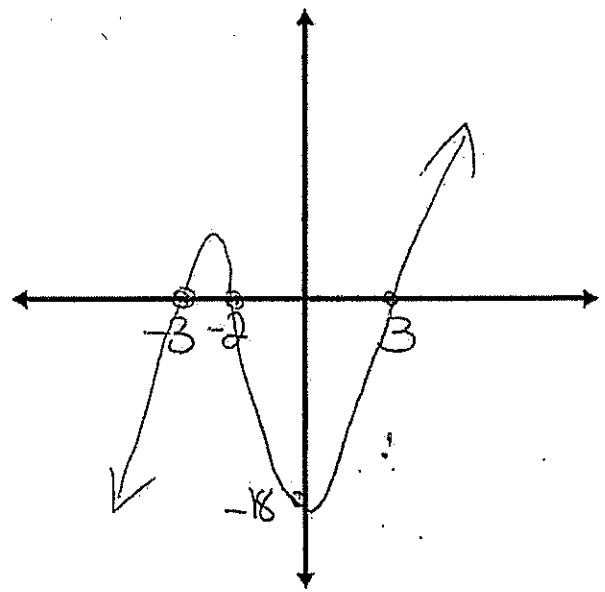
1. $f(x) = x^3 + 2x^2 - 9x - 18$
Shape: positive odd

y-intercept: -18

x-intercepts (zeros):
{-3, -2, 3}

End Behavior: down left
 $x \rightarrow -\infty, f(x) \rightarrow -\infty$
right up
 $x \rightarrow \infty, f(x) \rightarrow \infty$

increasing
decreasing
positive
negative



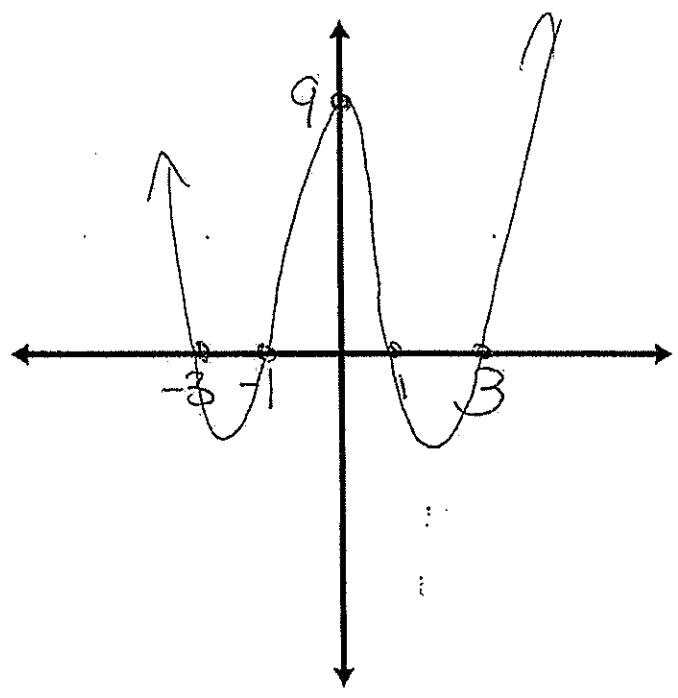
2. $f(x) = x^4 - 10x^2 + 9$
Shape: positive even

y-intercept: 9

x-intercepts (zeros):
{-3, -1, 1, 3}

End Behavior: up left
 $x \rightarrow -\infty, f(x) \rightarrow \infty$
right up
 $x \rightarrow \infty, f(x) \rightarrow \infty$

increasing
decreasing
positive
negative



3. $p(x) = -x^3 - 3x^2 + 4x + 12$

Shape: *negative odd* increasing

y-intercept:

12

decreasing

x-intercepts (zeros):

$\{-3, -2, 2\}$

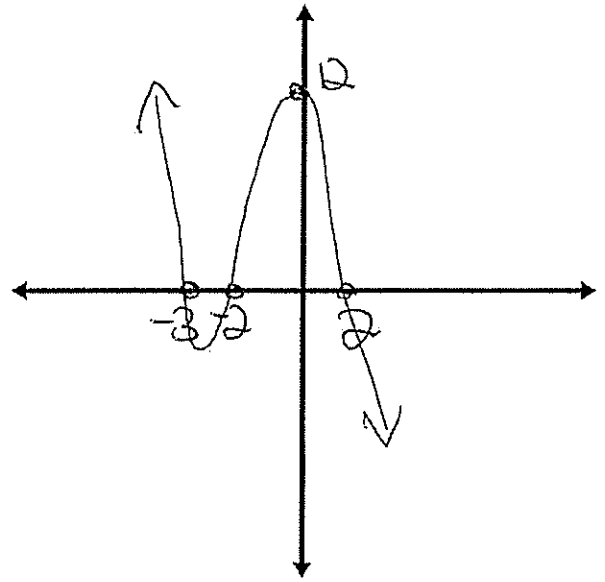
positive

End Behavior:

left $x \rightarrow -\infty, f(x) \rightarrow \infty$ *up*

right $x \rightarrow \infty, f(x) \rightarrow -\infty$ *down*

negative



4. $f(x) = -x^4 + 3x^3 + 10x^2 + 0$

Shape:

negative even increasing

y-intercept:

0

decreasing

x-intercepts (zeros):

$\{-2, 0, 5\}$

double root
bounces off

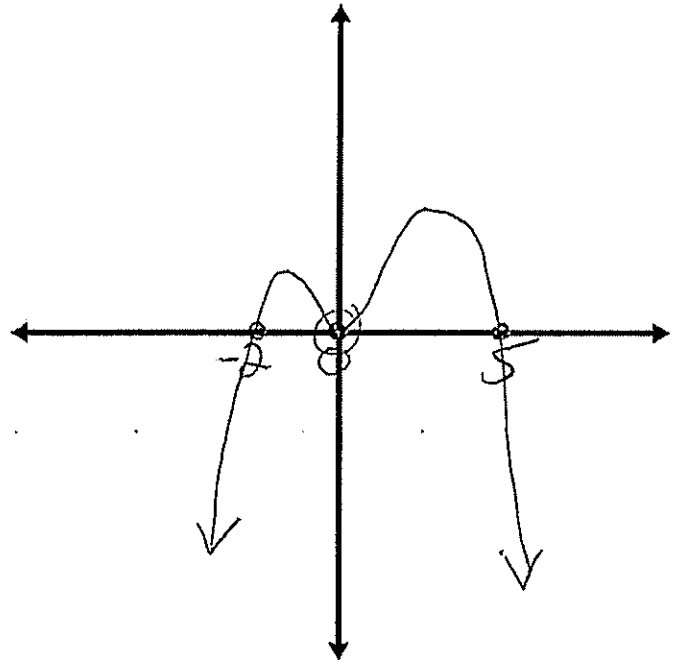
positive

End Behavior:

left $x \rightarrow -\infty, f(x) \rightarrow -\infty$ *down*

right $x \rightarrow \infty, f(x) \rightarrow -\infty$ *down*

negative



5. $p(x) = x^3 - 3x^2 - 9x + 27$

Shape: positive odd increasing

y-intercept:

27

decreasing

x-intercepts (zeros):

$\{-3, 3, 3\}$

double root
bounces off

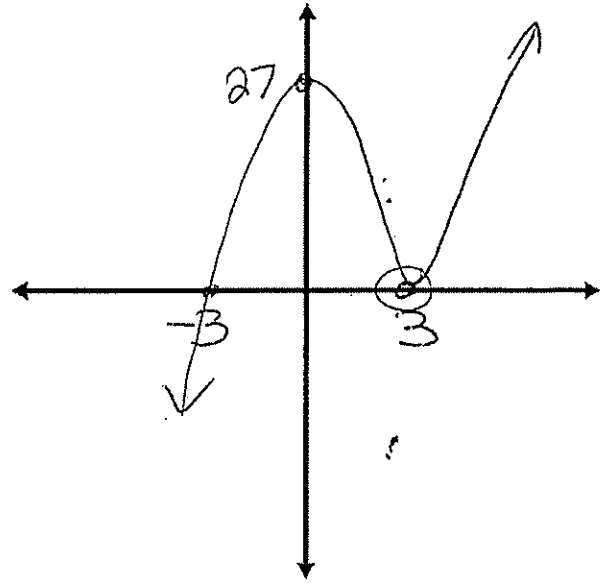
positive

End Behavior:

left $x \rightarrow -\infty, f(x) \rightarrow -\infty$ down

right $x \rightarrow \infty, f(x) \rightarrow \infty$ up

negative



6. $h(x) = x^6 - 5x^4 + 4x^2$

Shape:

positive even

increasing



y-intercept:

0

decreasing

x-intercepts (zeros):

$\{0, 0, 1, 4\}$

double root
bounces off

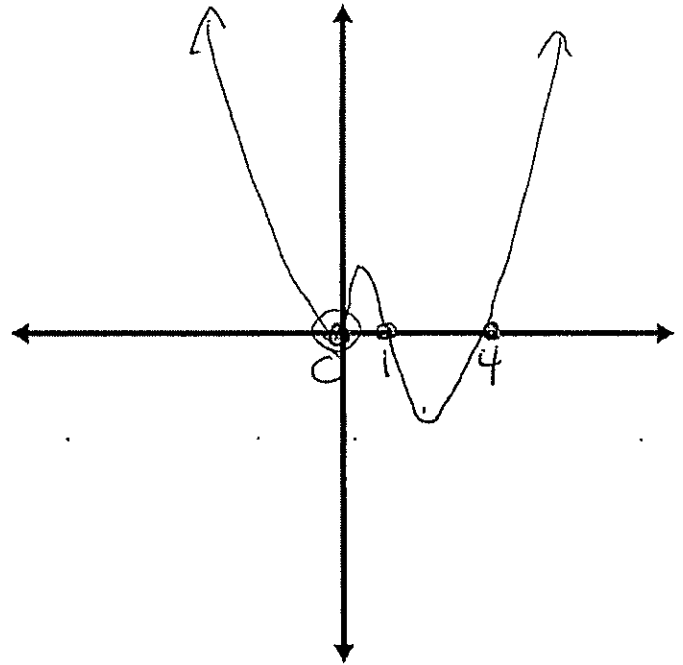
positive

End Behavior:

left $x \rightarrow -\infty, f(x) \rightarrow \infty$ up

right $x \rightarrow \infty, f(x) \rightarrow \infty$ up

negative



7. $f(x) = x^4 + 11x^3 + 15x^2 - 25x$

Shape: positive even
 ↗ increasing

y-intercept:

0

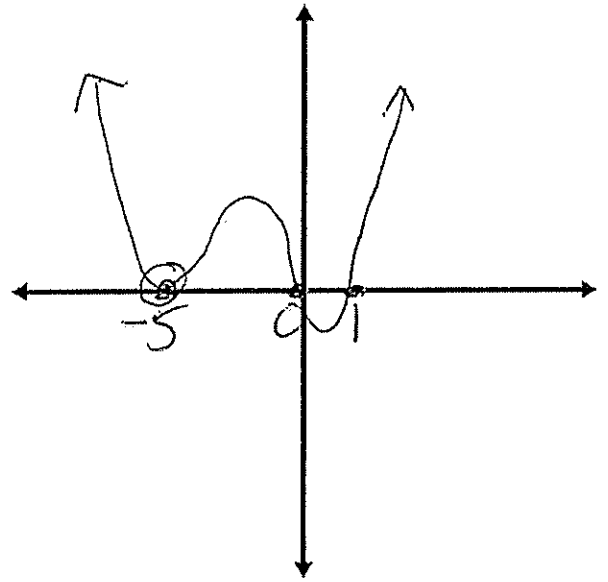
x-intercepts (zeros): decreasing
 $\{-5, -5, 0, 1\}$

double root
 bounces off

End Behavior:

left $x \rightarrow -\infty, f(x) \rightarrow \infty$ up positive

right $x \rightarrow \infty, f(x) \rightarrow \infty$ up negative



8. $g(x) = -x^5 + 5x^4 + 8x^3 - 44x^2 - 32x + 64$

Shape: negative odd
 ↘ increasing

y-intercept:

64

decreasing

x-intercepts (zeros):

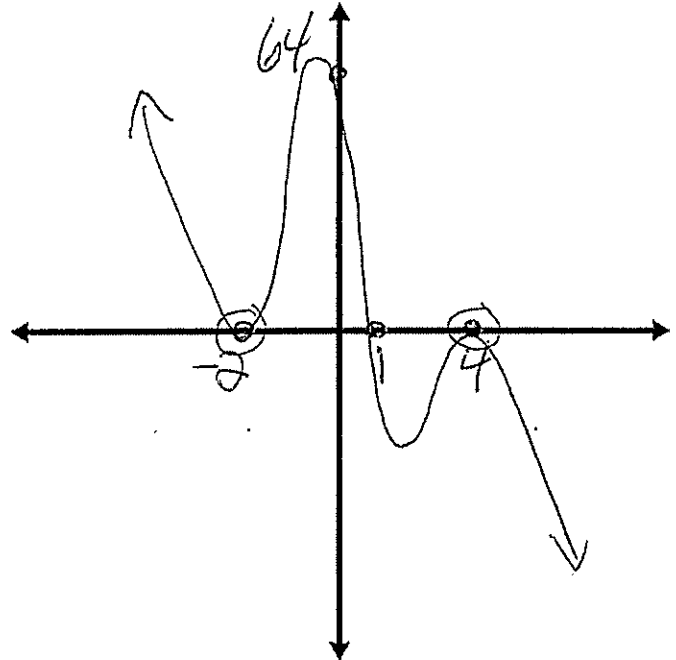
$\{-2, -2, 1, 4, 4\}$

double roots
 bounce off


End Behavior:

left $x \rightarrow -\infty, f(x) \rightarrow \infty$ up positive

right $x \rightarrow \infty, f(x) \rightarrow -\infty$ down negative



9. $f(x) = -2x^4 - 2x^3 + 34x^2 + 42x - 72$

Shape: negative even
 increasing

y-intercept:

-72

decreasing

x-intercepts (zeros):

$\{-3, -3, 1, 4\}$

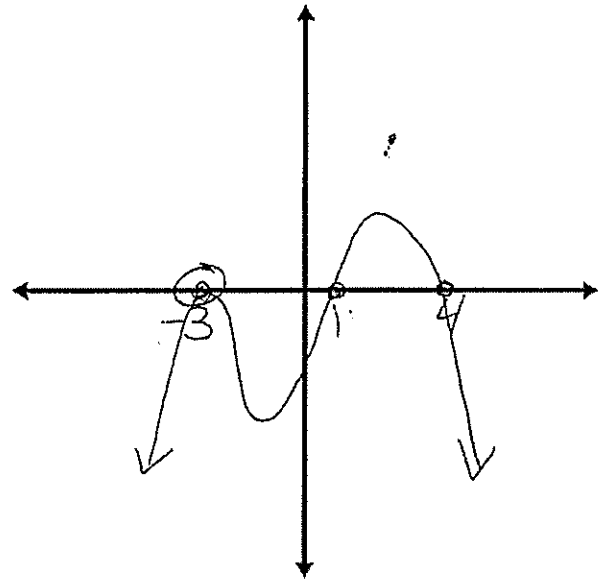
double root
bounces off

positive


End Behavior:

left $x \rightarrow -\infty, f(x) \rightarrow -\infty$ down
 right $x \rightarrow \infty, f(x) \rightarrow -\infty$ down

negative



10. $g(x) = -x^4 + 2x^3 + 4x^2 - 8x$

Shape: negative even
 increasing

y-intercept:

0

decreasing

x-intercepts (zeros):

$\{-2, 0, 2, 2\}$

double root
bounces off

positive

End Behavior:

left $x \rightarrow -\infty, f(x) \rightarrow -\infty$ down
 right $x \rightarrow \infty, f(x) \rightarrow -\infty$ down

negative

