

Name Schlansky
Mr. Schlansky

POSITIVE even
↖ ↗
POSITIVE odd
↘ ↗

NEGATIVE even
↖ ↘
NEGATIVE odd
↘ ↗
Date _____
Algebra II

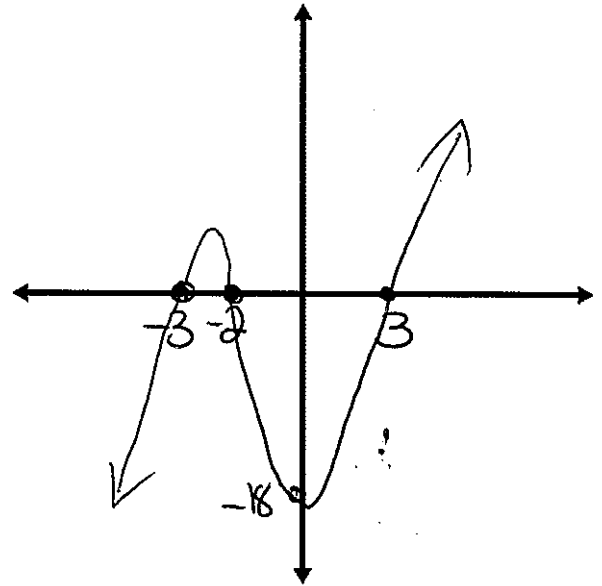
Sketching Polynomial Functions

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



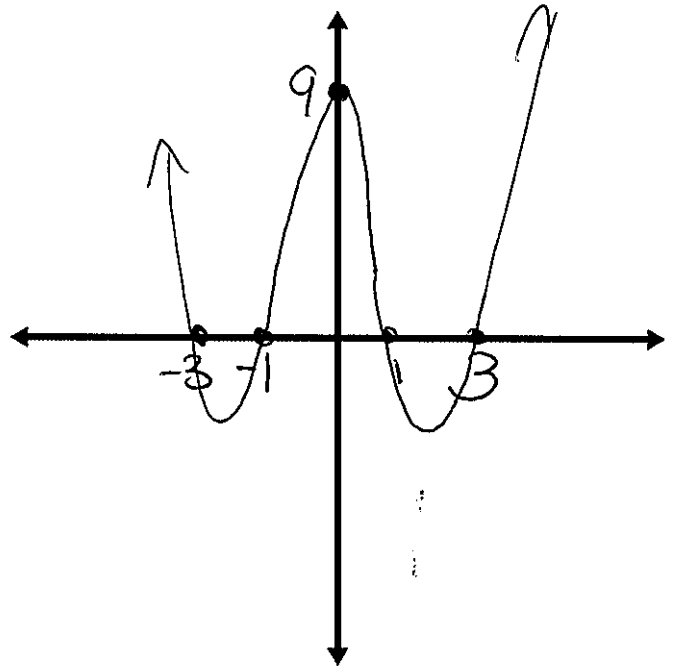
2. $f(x) = x^4 - 10x^2 + 9$
Shape:

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



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

Shape: *negative odd*

y-intercept:

12

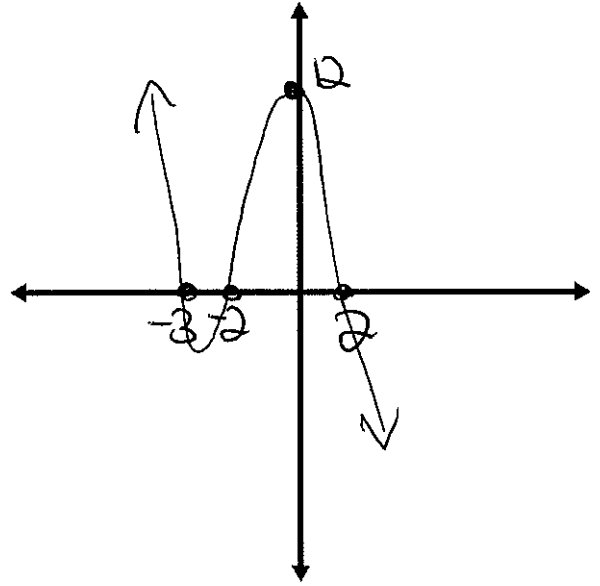
x-intercepts (zeros):

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

End Behavior:

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

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



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

Shape:

negative even

y-intercept:

0

x-intercepts (zeros):

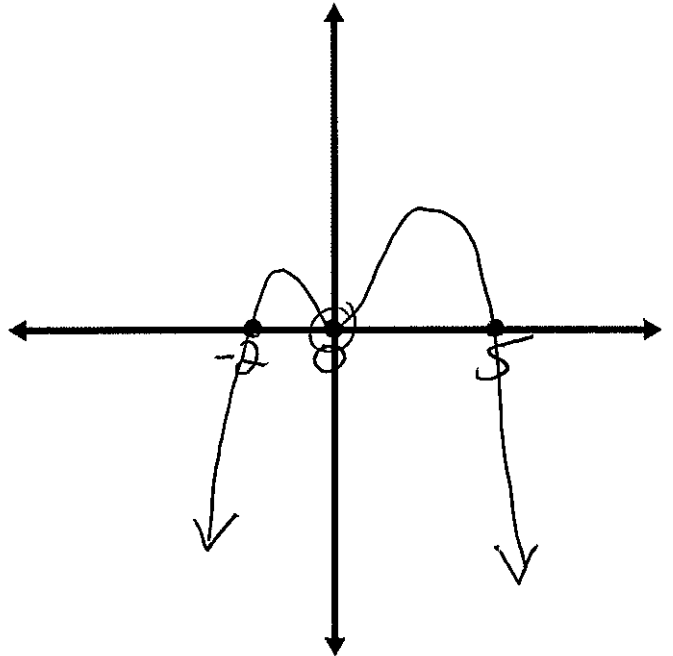
$\{-2, 0, 5\}$

double root
bounces off

End Behavior:

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

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



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

Shape: *positive odd*



y-intercept:

27

x-intercepts (zeros):

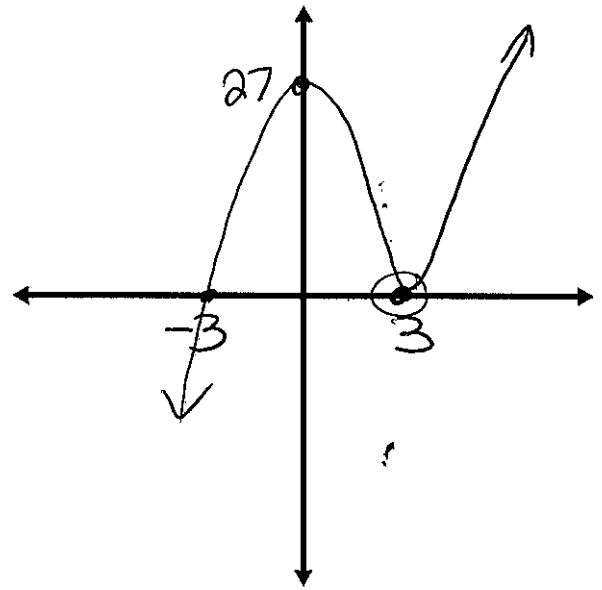
$\{-3, 3, 3\}$

*double root
bounces off*

End Behavior:

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

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



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

Shape: *positive even*



y-intercept:

0

x-intercepts (zeros):

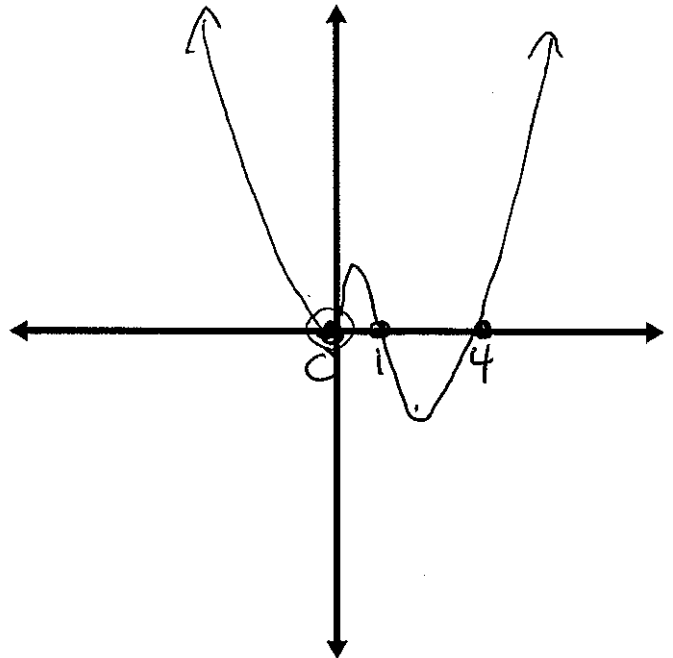
$\{0, 0, 1, 4\}$

*double root
bounces off*

End Behavior:

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

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



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

Shape: *positive even*

y-intercept:

0

x-intercepts (zeros):

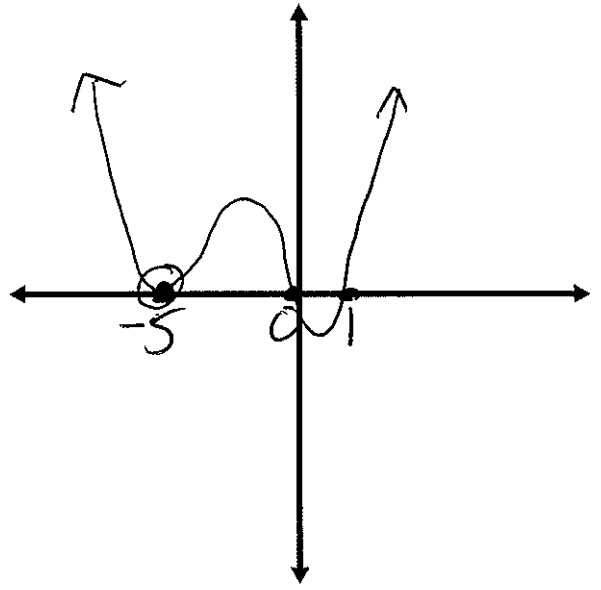
$\{-5, -5, 0, 1\}$

*double root
bounces off*

End Behavior:

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

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



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

Shape: *negative odd*

y-intercept:

64

x-intercepts (zeros):

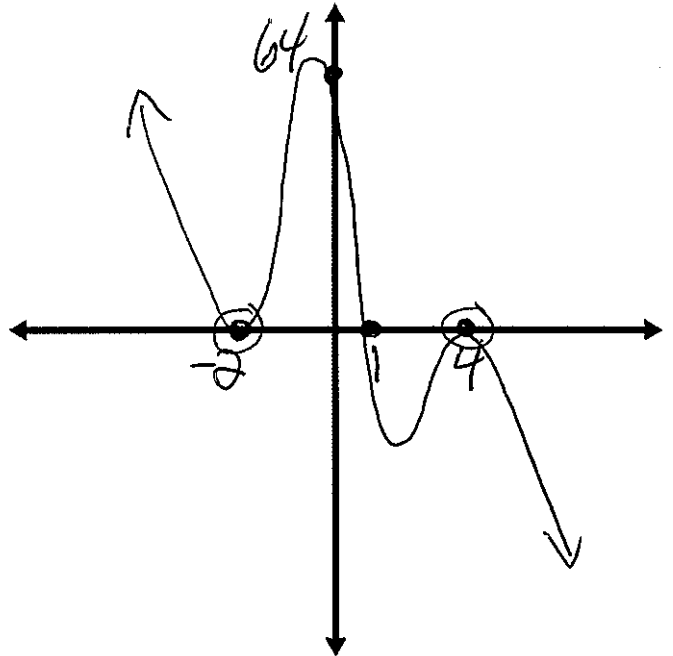
$\{-2, -2, 1, 4, 4\}$

*double roots
bounce off*

End Behavior:

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

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



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

Shape: negative even



y-intercept:

-72

x-intercepts (zeros):

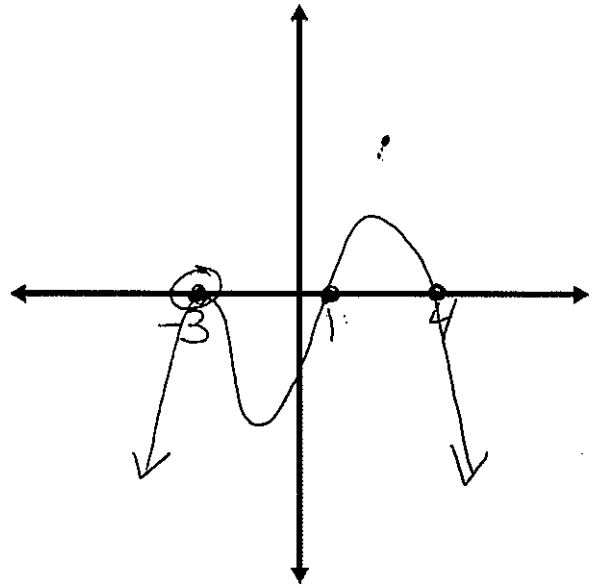
$\{-3, -3, 1, 4\}$

double root
bounces off

End Behavior:

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

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



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

Shape: negative even



y-intercept:

0

x-intercepts (zeros):

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

double root
bounces off

End Behavior:

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

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

