Answers

Kuta Software - Infinite Algebra 2 Name_____

Vertex Form of Parabolas & complete the square

Date_____ Period____

Use the information provided to write the vertex form equation of each parabola.

up 1) $y = x^2 + 16x + 71$

$y = (x + 8)^2 + 7$

vertex: $(-8, 7)$
axis: $x = -8$
min/max: 7

2) $y = x^2 - 2x - 5$

up $y = (x - 1)^2 - 6$

V: $(1, -6)$
a: $x = 1$
min/max: -6

down 3) $y = -x^2 - 14x - 59$

$y = -(x + 7)^2 - 10$

V: $(-7, -10)$
a: $x = -7$
min/max: -10

4) $y = 2x^2 + 36x + 170$

up $y = 2(x + 9)^2 + 8$

V: $(-9, 8)$
a: $x = -9$
min/max: 8

up 5) $y = x^2 - 12x + 46$

$y = (x - 6)^2 + 10$

V: $(6, 10)$
a: $x = 6$
min @ 10

6) $y = x^2 + 4x$

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

V: $(-2, -4)$
a: $x = -2$
min @ -4

down 7) $y = -\frac{1}{3}(x - 3)(x - 7)$

$y = -\frac{1}{3}(x - 5)^2 + \frac{4}{3}$

V: $(5, \frac{4}{3})$
a: $x = 5$
max @ $\frac{4}{3}$

8) $y + 60x + 294 = -3x^2$

down $y = -3(x + 10)^2 + 6$

V: $(-10, 6)$
a: $x = -10$
max @ 6

down 9) $-(y + 1) = (x - 4)^2$

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

V: $(4, -1)$
a: $x = 4$
max @ -1

down 10) $y = -2(x + 4)(x - 2)$

$y = -2(x + 1)^2 + 18$

V: $(-1, 18)$
a: $x = -1$
max @ 18

Answer

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Graphing Polynomial Functions: Basic Shape

Date_____ Period____

Describe the end behavior of each function.

1) $f(x) = x^3 - 4x^2 + 7$

$f(x) \to -\infty$ as $x \to -\infty$
$f(x) \to +\infty$ as $x \to +\infty$

falls left (FL)
rises right (RR)

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

$f(x) \to -\infty$ as $x \to -\infty$
$f(x) \to +\infty$ as $x \to +\infty$

FL
RR

3) $f(x) = x^3 - 9x^2 + 24x - 15$

$f(x) \to -\infty$ as $x \to -\infty$
$f(x) \to +\infty$ as $x \to +\infty$

FL
RR

4) $f(x) = x^2 - 6x + 11$

$f(x) \to +\infty$ as $x \to -\infty$
$f(x) \to +\infty$ as $x \to +\infty$

RL
RR

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

$f(x) \to -\infty$ as $x \to -\infty$
$f(x) \to +\infty$ as $x \to +\infty$

FL
RR

6) $f(x) = -x^2 + 4x$

$f(x) \to -\infty$ as $x \to -\infty$
$f(x) \to -\infty$ as $x \to +\infty$

falls left (FL)
falls right (RR)

7) $f(x) = 2x^2 + 12x + 12$

$f(x) \to +\infty$ as $x \to -\infty$
$f(x) \to +\infty$ as $x \to +\infty$

rises left (RL)
rises right (RR)

8) $f(x) = x^2 - 8x + 18$

$f(x) \to +\infty$ as $x \to -\infty$
$f(x) \to +\infty$ as $x \to +\infty$

RL
RR

State the maximum number of turns the graph of each function could make.

9) $f(x) = x^5 - 4x^3 + 5x + 1$

Max # Turns: 4

10) $f(x) = -x^2 - 1$

Max # Turns: 1

one less than the degree

11) $f(x) = x^4 - 4x^2 + x - 1$

Max # Turns: 3

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

Max # Turns: 3

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

Max # Turns: 2

14) $f(x) = -x^4 + 4x^2 + 3x - 1$

Max # Turns: 3

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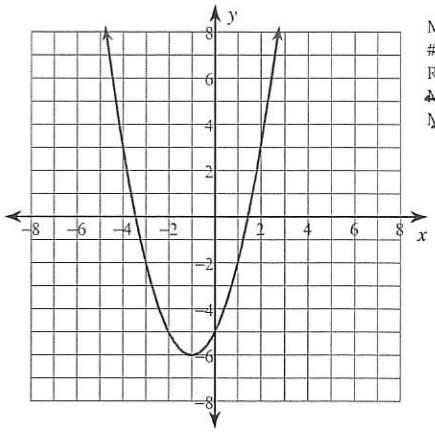
Graphing Polynomial Functions

Date_____ Period____

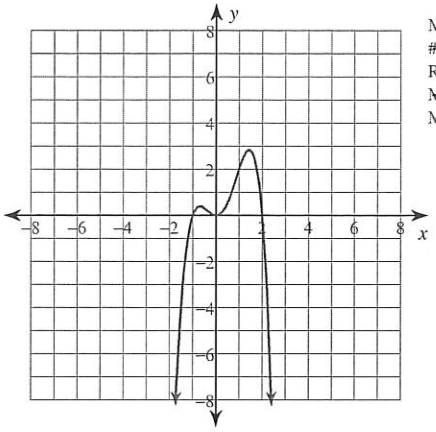
State the maximum number of turns the graph of each function could make. Then sketch the graph. State the number of real zeros. Approximate each zero to the nearest tenth. Approximate the relative minima and relative maxima to the nearest tenth.

1) $f(x) = x^2 + 2x - 5$



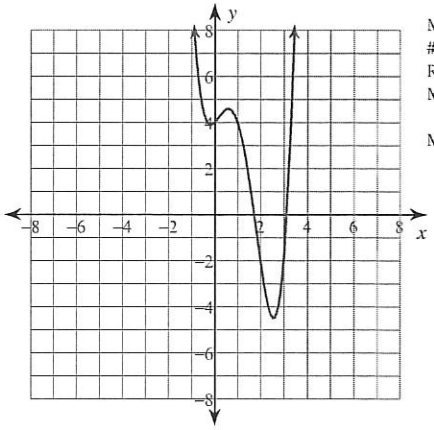
Max # Turns: 1
~~# Real Zeros: 2~~
Real Zeros: −3.4, 1.4
~~Minima: (−1, −6)~~
~~Maxima: None~~

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



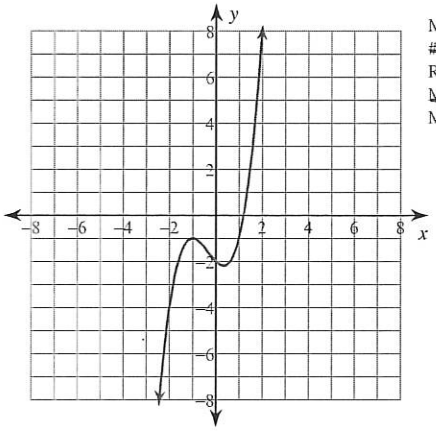
Max # Turns: 3
~~# Real Zeros: 3~~
Real Zeros: −1, 0, 2
~~Minima: (0, 0)~~
~~Maxima: (−0.7, 0.4)~~
~~(1.4, 2.8)~~

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



Max # Turns: 3
~~# Real Zeros: 2~~
Real Zeros: 1.7, 3.1
~~Minima: (−0.2, 3.9)~~
~~(2.6, −4.5)~~
~~Maxima: (0.6, 4.6)~~

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



Max # Turns: 2
~~# Real Zeros: 1~~
Real Zeros: 1.2
~~Minima: (0.3, −2.2)~~
~~Maxima: (−1, −1)~~