

## Graphing Polynomial Functions: Basic Shape

Date \_\_\_\_\_ Period \_\_\_\_\_

**Describe the end behavior of each function.**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Sketch the general shape of each function.**

15)  $f(x) = -x^2 - 6x - 7$

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

17)  $f(x) = x^2 + 2$

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

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

20)  $f(x) = x^3 - 2x^2 - 3$

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

22)  $f(x) = -x^3 + 10x^2 - 33x + 32$

## Graphing Polynomial Functions: Basic Shape

Describe the end behavior of each function.

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

$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty$

$f(x) \rightarrow +\infty \text{ as } x \rightarrow +\infty$

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

$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty$

$f(x) \rightarrow +\infty \text{ as } x \rightarrow +\infty$

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

$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty$

$f(x) \rightarrow +\infty \text{ as } x \rightarrow +\infty$

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

$f(x) \rightarrow +\infty \text{ as } x \rightarrow -\infty$

$f(x) \rightarrow +\infty \text{ as } x \rightarrow +\infty$

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

$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty$

$f(x) \rightarrow +\infty \text{ as } x \rightarrow +\infty$

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

$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty$

$f(x) \rightarrow -\infty \text{ as } x \rightarrow +\infty$

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

$f(x) \rightarrow +\infty \text{ as } x \rightarrow -\infty$

$f(x) \rightarrow +\infty \text{ as } x \rightarrow +\infty$

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

$f(x) \rightarrow +\infty \text{ as } x \rightarrow -\infty$

$f(x) \rightarrow +\infty \text{ as } x \rightarrow +\infty$

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

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

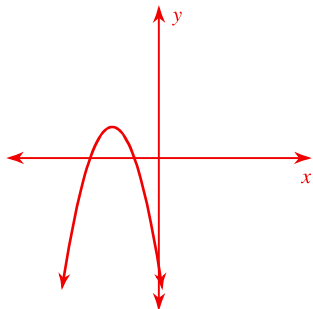
Max # Turns: 2

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

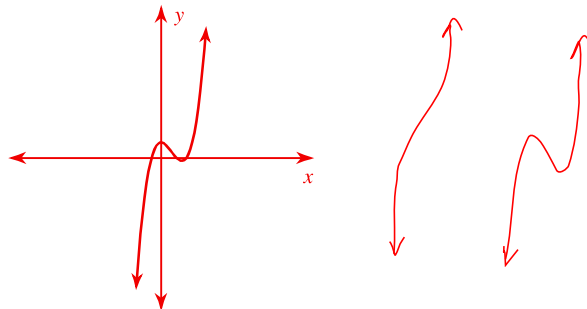
Max # Turns: 3

**Sketch the general shape of each function.**

15)  $f(x) = -x^2 - 6x - 7$

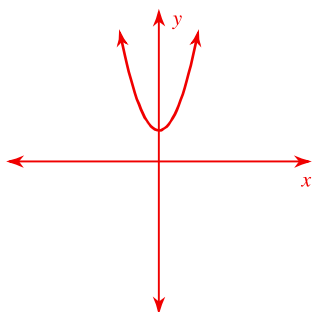


16)  $f(x) = x^3 - 2x^2 + 1$

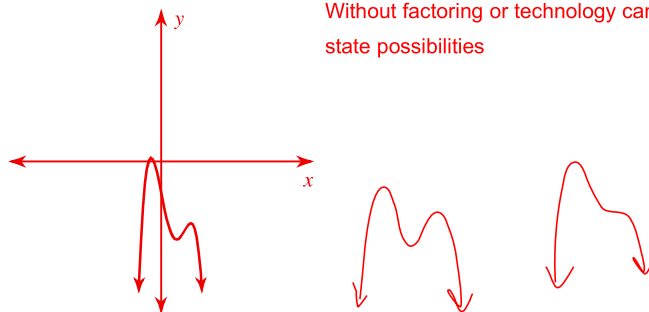


Without factoring or technology can only state possibilities

17)  $f(x) = x^2 + 2$

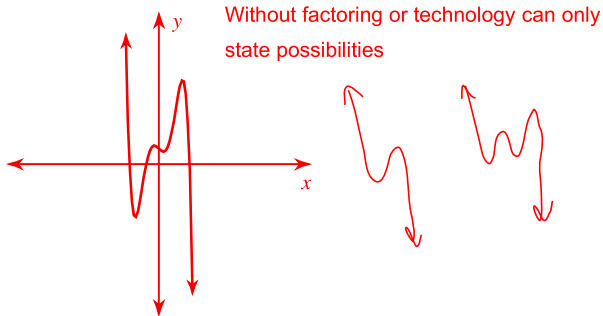


18)  $f(x) = -x^4 + 3x^3 - 2 - 5x$



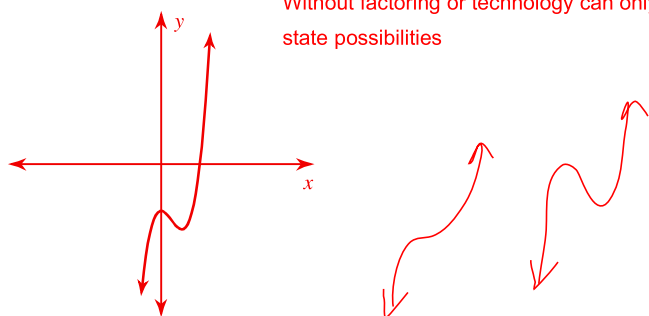
Without factoring or technology can only state possibilities

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



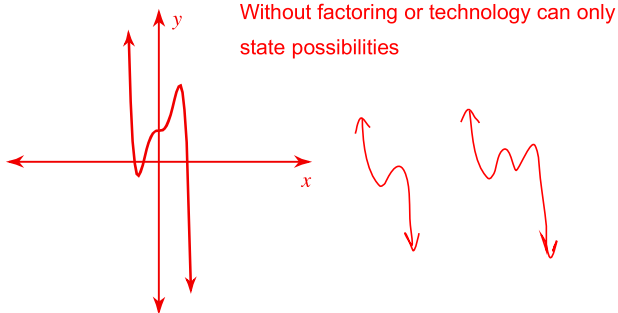
Without factoring or technology can only state possibilities

20)  $f(x) = x^3 - 2x^2 - 3$



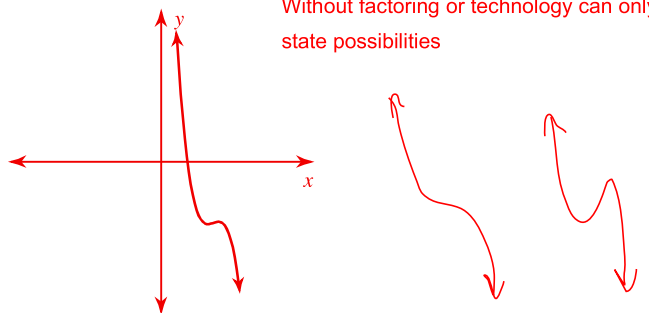
Without factoring or technology can only state possibilities

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



Without factoring or technology can only state possibilities

22)  $f(x) = -x^3 + 10x^2 - 33x + 32$



Without factoring or technology can only state possibilities