Panel 1 (top left):

Sketch a graph of this function:

$$y = -x^3(x - 6)(x + 4)^2(x - 9)(2 - x)^2$$

NEG   ODD
end-behavior

$(\uparrow , \downarrow)$

-4
D

T

2
D

6
S

9
S

Panel 2 (top right):
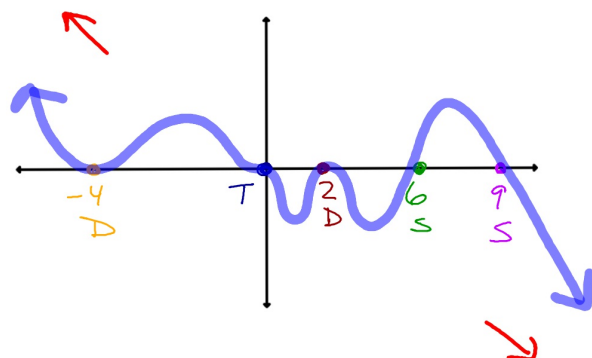
Sketch this function using the shapes of the zeros and the end behavior.

$$y = x^2(x - 4)^3(x + 9)^3(x - 7)^3(x + 3)^3(x + 6)^3$$

ODD POS
end-behavior

$(\swarrow , \nearrow)$

-9
T

-6
T

-3
T

D

4
T

7
T

Panel 3 (bottom left):
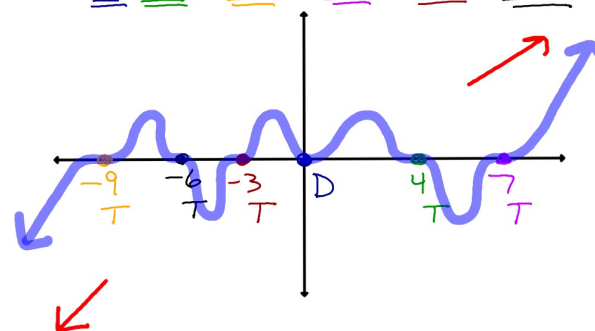
Sketch this function using the shapes of the zeros and the end behavior.

$$y = x^2(x + 6)^2(x - 7)^3(x + 3)^2(2 - x)$$

NEG EVEN:
end behavior

$(\swarrow , \downarrow)$

-6
D

-3
D

D

2
S

7
T

Panel 4 (bottom right):
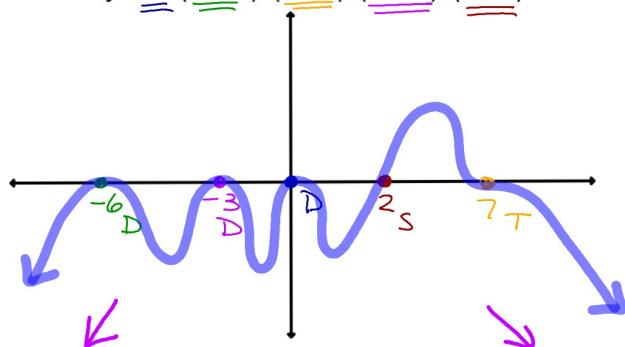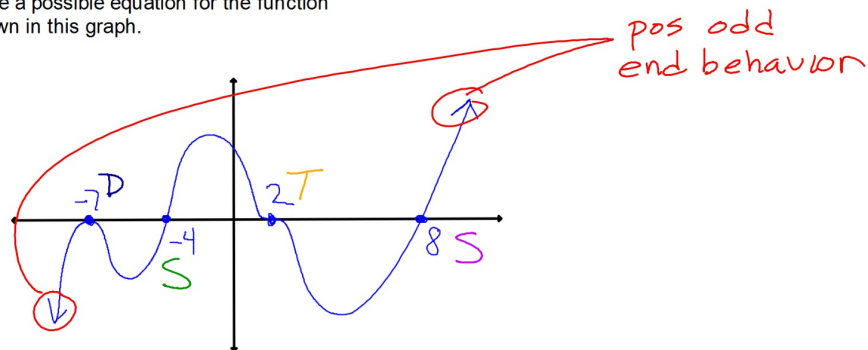
If you can take an equation and graph it, what else should you be able to do?

Start with the graph and write the equation

Panel 1 (top-left)
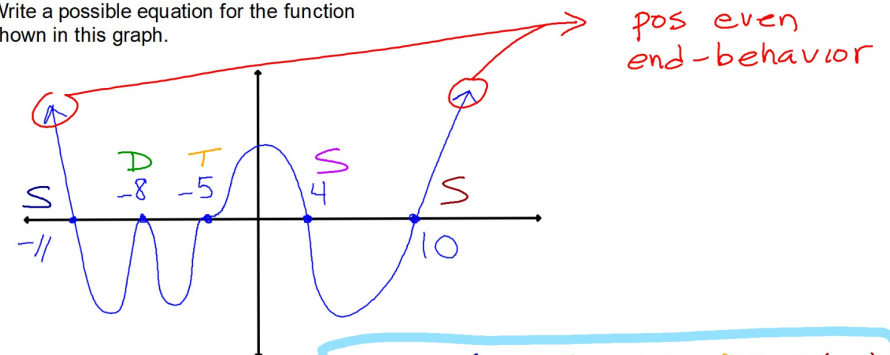
Write a possible equation for the function shown in this graph.

pos odd
end behavior

-7 D
2 T
-4 S
8 S

$$y = (x+7)^2 (x+4)(x-2)^3 (x-8)$$

After you write the equation add up the exponents to make sure you get an ODD number and double check the coefficients multiply to a Positive.

Panel 2 (top-right)

Write a possible equation for the function shown in this graph.

pos even
end-behavior

S -11
D -8 T -5
S 4
S 10

$$y = (x+11)(x+8)^2 (x+5)^3 (x-4)(x-10)$$

After you write the equation add up the exponents to make sure you get an EVEN number and double check the coefficients multiply to a Positive.
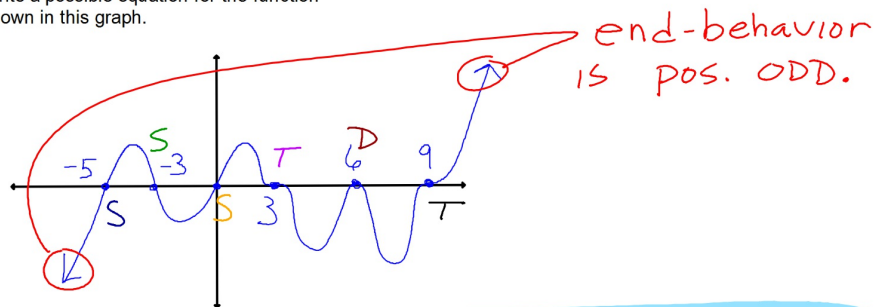
Panel 3 (bottom-left)

Write a possible equation for the function shown in this graph.

end-behavior
IS POS. ODD.

-5 S -3
S   S 3 T 6 D 9
T

$$y = x(x+5)(x+3)(x-3)^3 (x-6)^2 (x-9)^3$$

After you write the equation add up the exponents to make sure you get an ODD number and double check the coefficients multiply to a Positive.
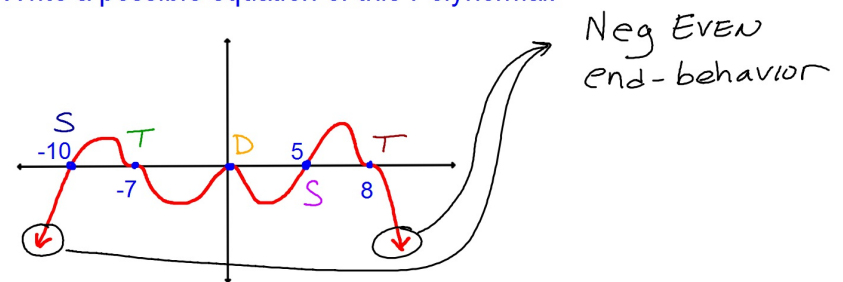
Panel 4 (bottom-right)

Write a possible equation of this Polynomial:

Neg EVEN
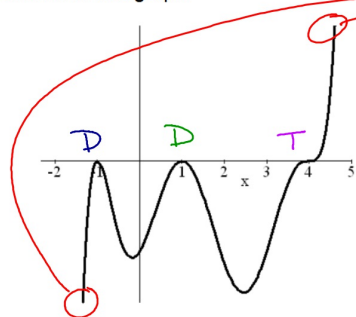end-behavior

S -10 T   D 5 T
-7 S 8

$$y = x^2 (x+10)(x+7)^3 (x-5)(x-8)^3$$

After you write the equation add up the exponents to make sure you get an ODD number and double check the coefficients multiply to a Negative. Since the above answer gives me a Pos. Coef. you can turn this into a Neg. Coef. by putting a negative sign at the beginning of the equation.

$$y = -x^2 (x+10)(x+7)^3 (x-5)(x-8)^3$$

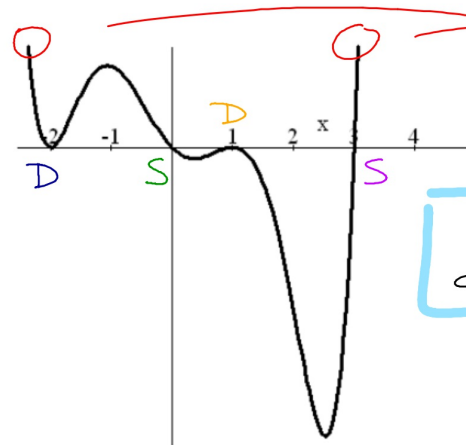Write a possible equation for the function shown in this graph.

pos odd end-behavior

D   D   T

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

After you write the equation add up the exponents to make sure you get an ODD number and double check the coefficients multiply to a Positive.

pos even end behavior

D   S   S

$$y = x(x+2)^2 (x-1)^2 (x-3)$$

After you write the equation add up the exponents to make sure you get an EVEN number and double check the coefficients multiply to a Positive.

Write a possible equation of a polynomial with the given zeros. Give your answer in Standard Form.
Zeros are 5(single zero) and -2(double zero)

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

$$y = (x-5)(x^2 + 4x + 4) \Rightarrow$$

	x^2	$+4x$	$+4$
x	x^3	$+4x^2$	$+4x$
-5	$-5x^2$	$-20x$	-20

$$y = x^3 - x^2 - 16x - 20$$