Polynomials Investigation

Team Members:

CLOSURE

Based on your team's observations, answer the questions that follow.

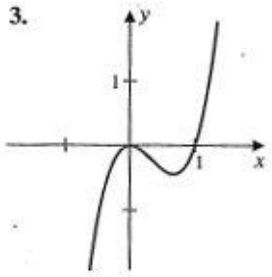
Refer to Investigation 1:

1. How would the graph of $p(x) = x^4 - 2x^3 - x^2 + 2x$ be similar to the graphs of $f(x), g(x)$ & $h(x)$? How might it be different?

Refer to Investigation 2:

2. The graph of a 7th degree polynomial would have right-end behavior EQUAL TO/OPPOSITE (circle one) its left-end behavior, at most _____ x-intercepts, and at most _____ turning points.

Determine the lowest possible degree for the polynomial whose graph is shown.

3. 

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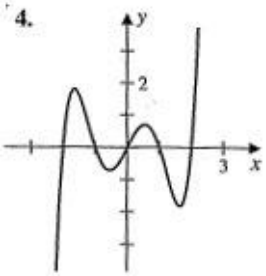
4. 

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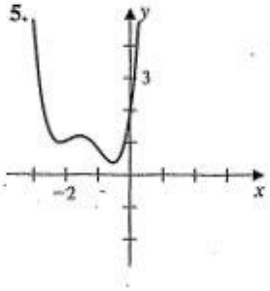
5. 

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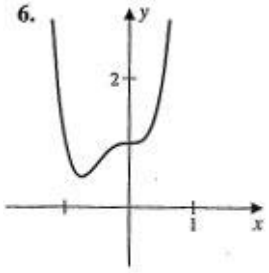
6. 

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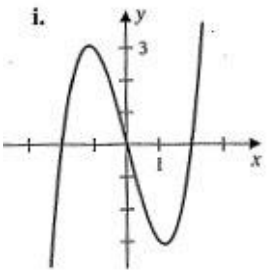
Refer to Investigation 3:

7. Determine the x-intercepts of the polynomial and predict whether the graph will cross or be tangent to the x-axis:

$$p(x) = (x-5)(x+6)^3(x-10)^2$$

8. Match the equation with the graph. *Do not use any graphing technology.*

a. $y = x(x+2)^2(x-2)$ b. $y = x(x+2)(x-2)^2$ c. $y = x(x+2)(x-2)$ d. $y = x^2(x+2)(x-2)$

i. 

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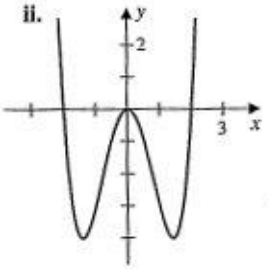
ii. 

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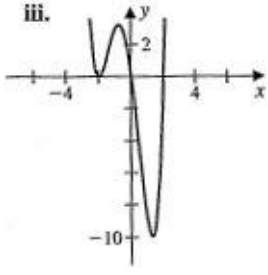
iii. 

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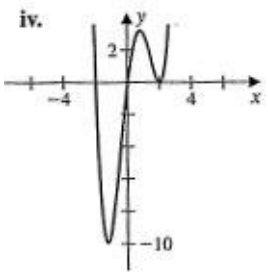
iv. 

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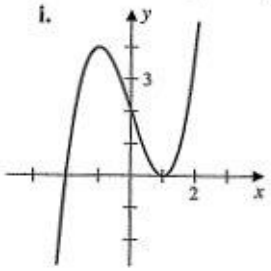
9. Match the equation with the graph. *Do not use any graphing technology.*

a. $y=(x-1)(x+1)(x+3)$ b. $y=x^2(x-2)$ c. $y=(x+2)(x-1)^2$ d. $y=x(x+2)(1-x)$

i.



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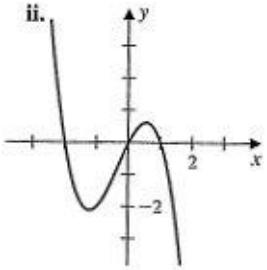

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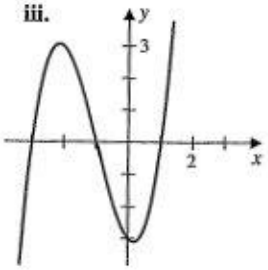

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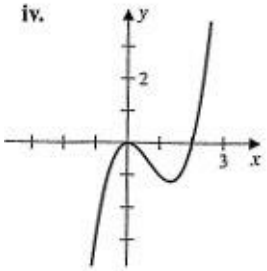
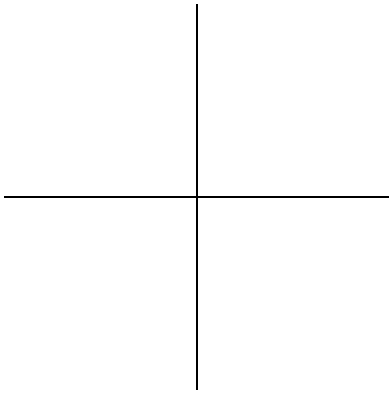


_____ _____ _____ _____

10. Sketch a 5th degree polynomial that is tangent to the x-axis at $x=-3$ & $x=4$, crosses the x-axis at $x=1$ and has a negative y-intercept.



What is the end behavior on the left?

What is the end behavior on the right?