

4.3

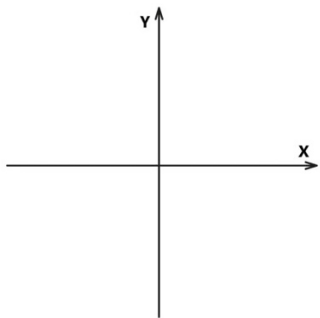
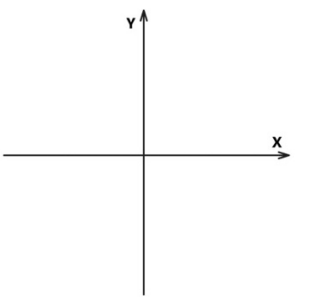
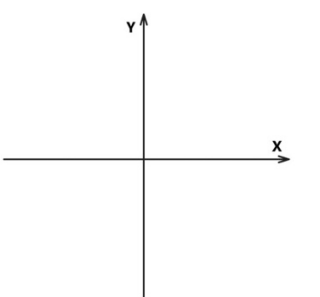
Name _____ Date _____ Period _____
2023-2024

SCORE:

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Complex Zeros

Let's explore the graphs of higher degree polynomials. Use Desmos or a graphing calculator to graph each function. Sketch a graph below.

Equation	Sketch Graph	Extension						
<p>1. $y = 3x^3(x - 5)^4$</p> <p># of zeros: _____</p> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 10px 0;">Solve</div> <p>What are the zeros? _____</p>	 <p># of x-intercepts: _____</p> <p>x-intercepts: _____</p>	<p>The number of zeros/ x-intercepts don't match... Explain why?</p>						
<p>2. $y = 3x^2 - 6x + 10$</p> <p># of zeros: _____</p> <p><i>*Hint: quadratic formula</i></p> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 10px 0;">Solve</div> <p>What are the zeros? _____</p>	 <p># of x-intercepts: _____</p> <p>x-intercepts: _____</p>	<p>Why can there be 2 zeros but no x-intercepts?</p>						
<p>3. $y = -2x^3 - 10x^2 + 12x$</p> <p># of zeros: _____</p> <p><i>*Hint: Factor</i></p> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 10px 0;">Solve</div> <p>What are the zeros? _____</p>	 <p># of x-intercepts: _____</p> <p>x-intercepts: _____</p>	<p>Fill in the information in the table.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Zero</th> <th style="width: 33%;">Multiplicity</th> <th style="width: 33%;">Touch/Cross</th> </tr> </thead> <tbody> <tr> <td style="height: 40px;"></td> <td></td> <td></td> </tr> </tbody> </table> <p>Identify the end behavior</p> <p>$\lim_{x \rightarrow -\infty} f(x) =$</p> <p>$\lim_{x \rightarrow +\infty} f(x) =$</p>	Zero	Multiplicity	Touch/Cross			
Zero	Multiplicity	Touch/Cross						

4. $y = x^4 - 5x^2 - 36$

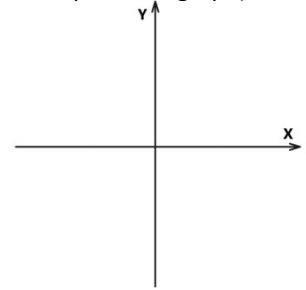
of zeros: 4

Find ALL the zeros algebraically (Factor completely, hint: first factor by grouping)

Solve

What are the zeros? _____

(make sure to zoom out, to see the whole shape of the graph)



of x-intercepts: ____

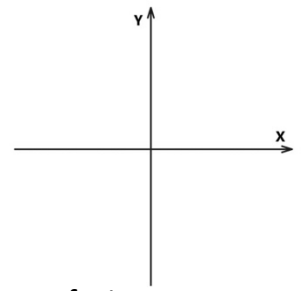
x-intercepts: _____

5. $y = x^3 - 8$

of zeros: ____

Solve

What are the zeros? _____



of x-intercepts: ____

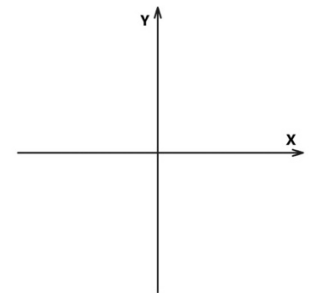
x-intercepts: _____

6. $y = -4x^2 - x - 3$

of zeros: ____

Solve

What are the zeros? _____



of x-intercepts: ____

x-intercepts: _____

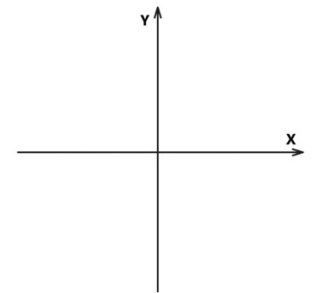
7. $y = x^2 + 9$

of zeros: ____

Find ALL the zeros algebraically by factoring

Solve

What are the zeros? _____



of x-intercepts: ____

x-intercepts: _____