Name: _____ Class: _____ Date: _____ ID: A

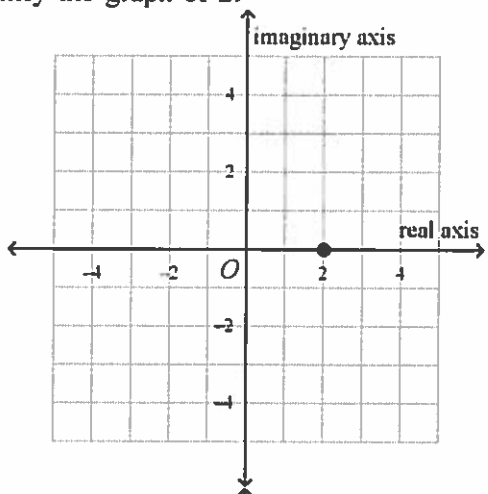
# Algebra 2, Complex #s and Polys Practice Test

**Simplify the number using the imaginary unit *i*.**

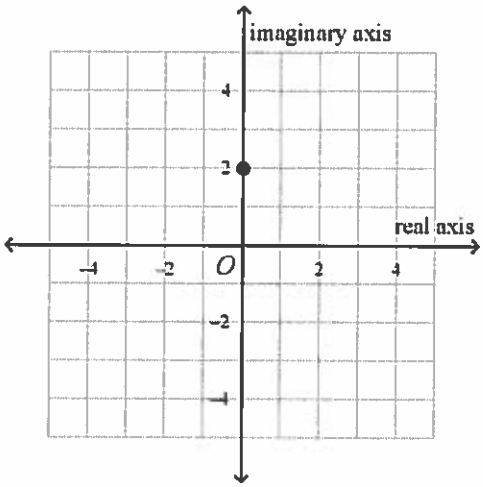
1. $\sqrt{-20}$

____ 2. Identify the graph of $2i$

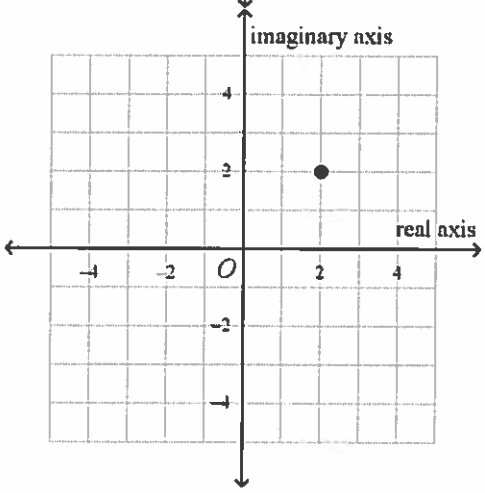
a.



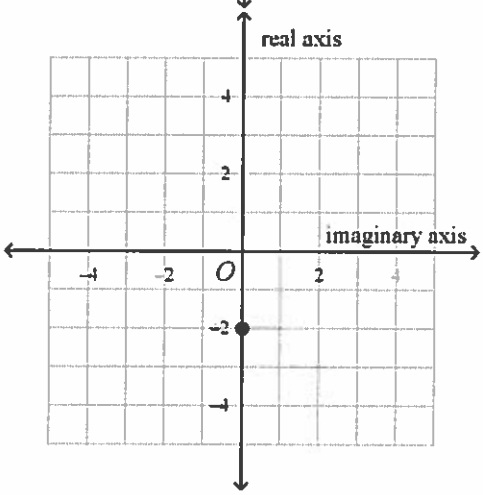

c.




b.




d.




**Simplify the expression.**

3. $(-2 + 3i) + (-1 + i)$

4. $(-3 + 4i) - (-2 + i)$

5. $(3 - 5i)(3 + 3i)$

**What are the solutions?**

6. $\frac{1}{2}x^2 + x + 2 = 0$

7. Classify $-6x^5 - 5x^4 + 8x^2$ by degree.

8. Write $-x^2(2x^2 - 4x^3)$ in standard form.

**Consider the leading term of each polynomial function. What is the end behavior of the graph?**

____ 9. $3x^7 + 6x^6 - 8x^5 - 1$

a. The leading term is $3x^7$. Since $n$ is odd and $a$ is positive, the end behavior is down and up.

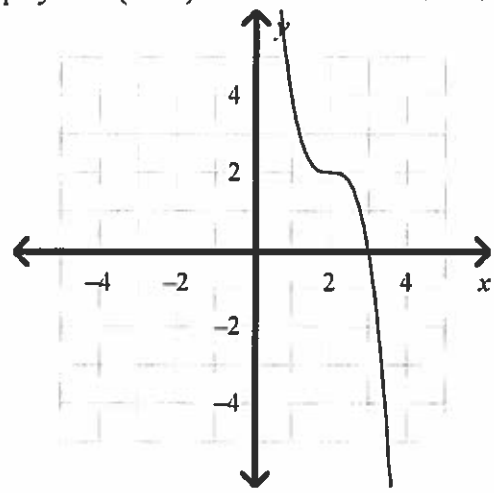
b. The leading term is $3x^7$. Since $n$ is odd and $a$ is positive, the end behavior is up and up.

c. The leading term is $3x^7$. Since $n$ is odd and $a$ is positive, the end behavior is up and down.

d. The leading term is $3x^7$. Since $n$ is odd and $a$ is positive, the end behavior is down and down.

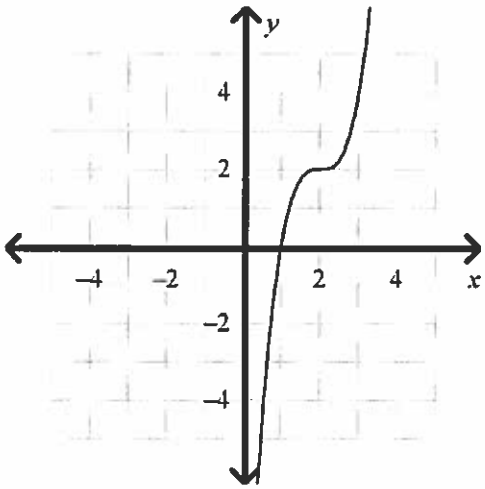
____ 10. Graph $y = -2(x+2)^3 - 2$ and describe the end behavior.

a.



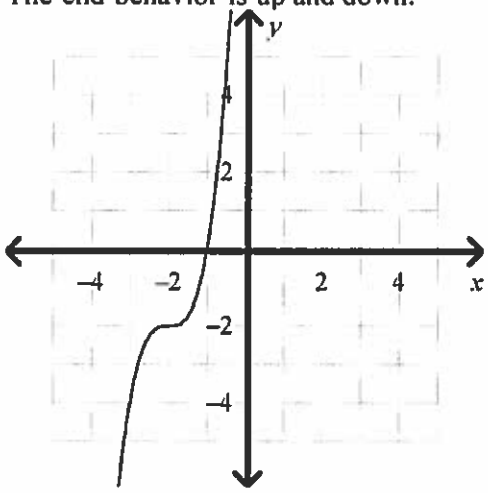

The end behavior is up and down.

c.



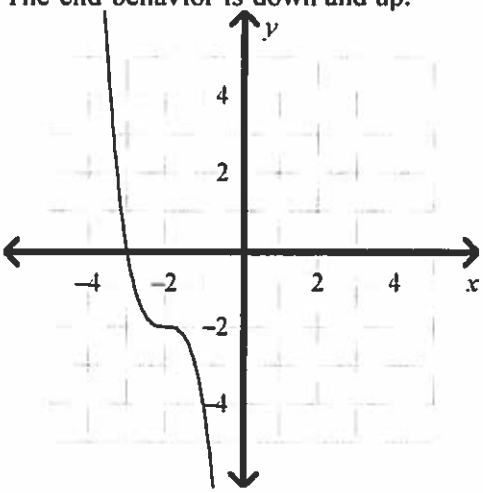

The end behavior is down and up.

b.




The end behavior is down and up.

d.




The end behavior is up and down.

**Write the polynomial in factored form.**

11. $5x^3 - 5x^2 - 30x$

**What are the zeros of the function? Graph the function.**

12. $y = (x+3)(x-2)(x-4)$

____ 13. What is a cubic polynomial function in standard form with zeros $-3$, $-2$, and $-1$?

a. $f(x) = x^3 - 6x^2 - 11x + 6$
b. $f(x) = x^3 - 6x^2 + x + 6$
c. $f(x) = x^3 + 6x^2 + 11x + 6$
d. $f(x) = x^3 - 6x^2 + 11x + 6$

____ 14. What is a quadratic polynomial function in standard form with zeros $-3$, $3$, $-2$, and $-2$?

a. $g(x) = x^4 + 4x^3 - 5x^2 - 36x - 36$
b. $g(x) = x^4 - 4x^3 - 11x^2 + 36x - 36$
c. $g(x) = x^4 + 4x^3 - 11x^2 - 5x - 36$
d. $g(x) = x^4 - 4x^3 + 5x^2 + 36x - 36$

**What are the zeros of the function? What are their multiplicities?**

____ 15. $f(x) = x^4 + 4x^3 + 3x^2$

a. the numbers 0 and $-3$ are zeros of multiplicity 2; the number $-1$ is a zero of multiplicity 1
b. the number 0 is a zero of multiplicity 2; the numbers 3 and 1 are zeros of multiplicity 1
c. the numbers 3 and 1 are zeros of multiplicity 2; the number 0 is a zero of multiplicity 1
d. the number 0 is a zero of multiplicity 2; the numbers $-3$ and $-1$ are zeros of multiplicity 1

**What is the relative maximum and minimum of the function?**

16. $f(x) = x^3 + 5x^2 - 30x$

17. Miguel is designing shipping boxes that are rectangular prisms. The shape of one box, with height $h$ in feet, has a volume defined by the function $V(h) = h(h - 5)(h - 6)$. Graph the function. What is the maximum volume for the domain $0 < h < 6$? Round to the nearest cubic foot.