Honors Algebra 2 Name_____ ID: 1

Fall Final Exam REVIEW

Date_____ Period____

Simplify.

1) $(3 - 2i) + (4 - 7i)$

$7 - 9i$

2) $(1 + 8i) - (-5 + 7i)$

$6 + i$

3) $(-4 - 8i)(-3 - 8i)$

$-52 + 56i$

4) $(-i)(-6i)(-5 - 6i)$

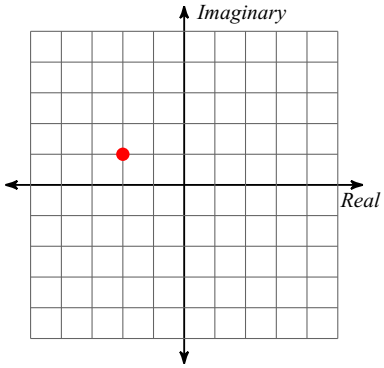
$30 + 36i$

5) $-\frac{7}{5i}$ $\frac{7i}{5}$

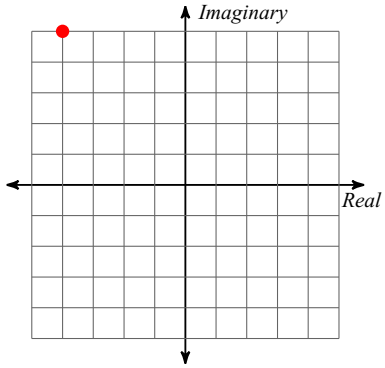
6) $\frac{4i}{-2 + 10i}$ $\frac{-i + 5}{13}$

Graph each number in the complex plane.

7) $-2 + i$



8) $-4 + 5i$



Factor each completely.

9) $3x^3 - 10x^2 - 50x$

$x(3x^2 - 10x - 50)$

10) $14p^2 + 6p$

$2p(7p + 3)$

11) $10x^2 - 108x + 162$

$2(5x - 9)(x - 9)$

12) $14x^3 + 7x^2 + 2x + 1$

$(7x^2 + 1)(2x + 1)$

13) $363a^2 - 108$

$3(11a + 6)(11a - 6)$

14) $343 - 1078r + 847r^2$

$7(7 - 11r)^2$

15) $343x^3 - 64$

$(7x - 4)(49x^2 + 28x + 16)$

16) $343x^3 - 27$

$(7x - 3)(49x^2 + 21x + 9)$

Solve each equation by factoring.

17) $3a^2 = -126 - 39a$

$\{-7, -6\}$

18) $x^2 = -6x - 5$

$\{-5, -1\}$

Solve each equation by taking square roots.

19) $6x^2 - 2 = 130$

$\{\sqrt{22}, -\sqrt{22}\}$

20) $49m^2 - 3 = 1$ $\left\{\frac{2}{7}, -\frac{2}{7}\right\}$

Solve each equation by completing the square.

21) $a^2 + 2a - 18 = 4$

$\{-1 + \sqrt{23}, -1 - \sqrt{23}\}$

22) $b^2 - 2b - 44 = -7$

$\{1 + \sqrt{38}, 1 - \sqrt{38}\}$

Solve each equation with the quadratic formula.

23) $3n^2 = -6 + 9n$

$\{2, 1\}$

24) $4x^2 = 12$

$\{\sqrt{3}, -\sqrt{3}\}$

Simplify each expression.

25) $(4 - 7x^3 - 4x) + (3 + 2x^4 + 4x)$

$2x^4 - 7x^3 + 7$

26) $(m^2 + 8m^4 + 3m^3) + (7m + m^2 + 3m^3)$

$8m^4 + 6m^3 + 2m^2 + 7m$

Find each product.

27) $(4m - 1)(3m + 6)$

$12m^2 + 21m - 6$

28) $(4n - 7)(2n + 7)$

$8n^2 + 14n - 49$

29) $(5 + 6n)^2$

$25 + 60n + 36n^2$

Divide.

30) $(n^3 - 14n^2 + 44n + 32) \div (n - 7)$

$n^2 - 7n - 5 - \frac{3}{n - 7}$

31) $(6r^5 - 3r^4 + 24r^2 + 6r - 15) \div (6r - 3)$

$r^4 + 4r + 3 - \frac{2}{2r - 1}$

Expand completely.

32) $(2n^4 + m)^4$

$16n^{16} + 32n^{12}m + 24n^8m^2 + 8n^4m^3 + m^4$

33) $(m + n)^4$

$m^4 + 4m^3n + 6m^2n^2 + 4mn^3 + n^4$

Find the inverse of each function.

34) $g(x) = -x + 3$

$g^{-1}(x) = -x + 3$

35) $f(x) = -x - 3$

$f^{-1}(x) = -x - 3$

State if the given functions are inverses.

36) $g(x) = \dfrac{2}{-x+2} + 1$

$f(x) = \dfrac{3}{-x+1} + 2$

No

37) $h(n) = 4n$

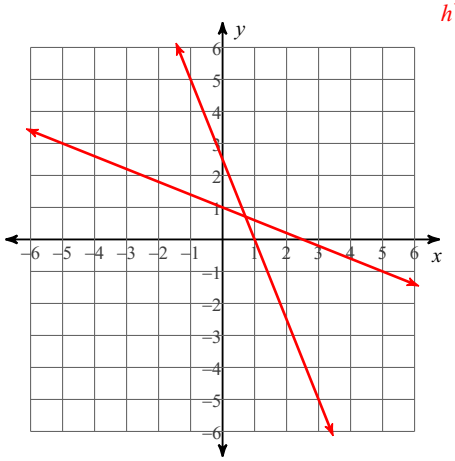
$f(n) = \dfrac{1}{4}n$

Yes

Find the inverse of each function. Then graph the function and its inverse.

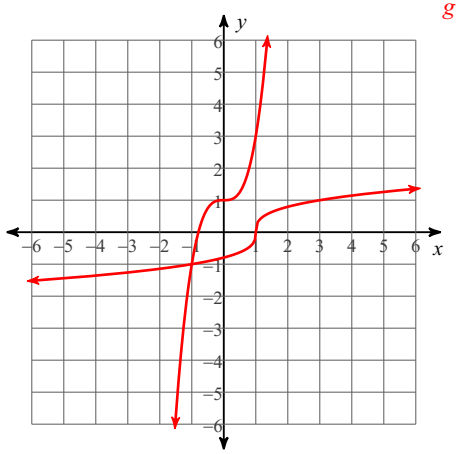
38) $h(n) = \dfrac{-5n+5}{2}$

$h^{-1}(n) = \dfrac{5-2n}{5}$



39) $g(x) = \sqrt[3]{\dfrac{x-1}{2}}$

$g^{-1}(x) = 1 + 2x^3$



Evaluate each function at the given value.

40) $f(a) = a^3 + 3a^2 + 6a - 3$ at $a = -2$

-11

Find all zeros.

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

$\left\{0, \dfrac{1}{3}, -1, 1\right\}$

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

$\left\{1, -\dfrac{1}{3}, -1\right\}$

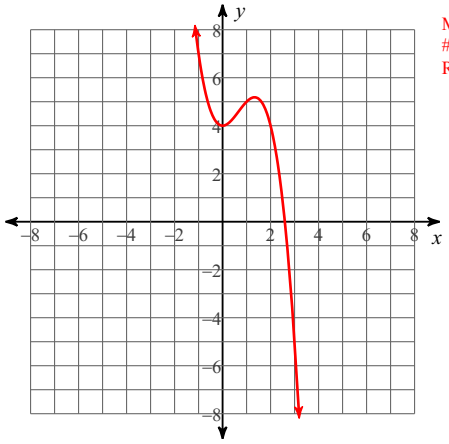
State the number of complex zeros, the possible number of real and imaginary zeros, and the possible rational zeros for each function. Then find all zeros.

43) $f(x) = x^3 + 8$

# of complex zeros: 3
Possible # of real zeros: 3 or 1
Possible # of imaginary zeros: 2 or 0
Possible rational zeros: $\pm 1, \pm 2, \pm 4, \pm 8$
Zeros: $\{-2, 1 + i\sqrt{3}, 1 - i\sqrt{3}\}$

State the maximum number of turns the graph of each function could make. Then sketch the graph. State the number of real zeros. Approximate each zero to the nearest tenth.

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



Max # Turns: 2
Real Zeros: 1
Real Zeros: 2.6