Name:_____ Period:_____

Honors Advanced Algebra

Study Guide Key Concept 2—Polynomials

Use the given functions to perform the operations.

$h(x)=3x-4$ $g(x)=-2x^2+7x-8$ $f(x)=8-3i$ $b(x)=12-i$ $d(x)=-3+4i$

1) Find $(h-g)(x)$

2) Find $(h\cdot g)(x)$

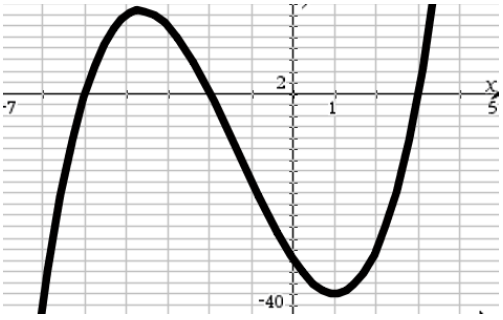
3) Find $(f+2b-d)(x)$

Write the following in standard form.

4) $(3-8i)^2$

Determine the factors of the graphed polynomial

5)



Create a polynomial of least degree in factored form using the information given below.

6) $x=8$ $x=-6$ $x=-13$

7) $x=-2$ $x=-9i$

Solve using algebra AND check your work using a graphing calculator.

8) $x^3-81x=0$

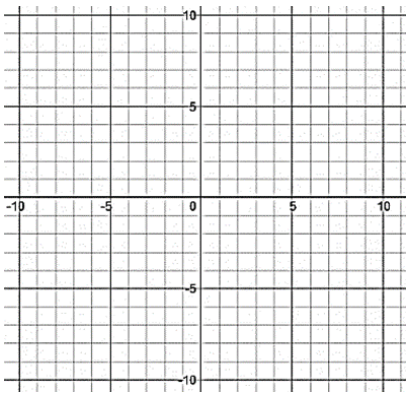
9) $2x^3+20x^2=48x$

10) You know that $2x^3-17x^2+19x+14$ has a factor of $(x-2)$. What are the other two factors?

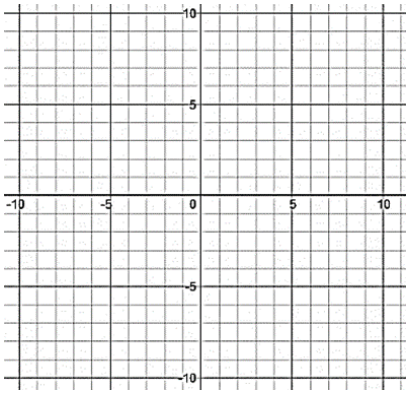
11) Multiplying $(x+4)$ by what quadratic expression gives us $x^3-2x^2-15x+36$?

Sketch a polynomial with the following features.

12) Zeros: { -5, -1, 7 }
Min of y = -8 at (-3,-8)
Max of y = 4 at (3,4)



13) Factors: (x+4), x, (x-6)
Min of y = -5 at (3,-5)
Max of y = 7 at (-2,7)



State the intervals that contain the relative min and relative max.

14)

x	f(x)
-6	-27
-5	0
-4	7
-3	0
-2	-15
-1	-32
0	-45
1	-48
2	-35
3	0
4	63
5	160

Describe the end behavior in limit notation. Also state the domain and range.

15) $f(x) = x^3 - 3x + 2$

$\lim_{x \to -\infty} f(x) =$

$\lim_{x \to \infty} f(x) =$

Domain:

Range:

16) $g(x) = -x^3 + x^2 + 5x + 1$

$\lim_{x \to -\infty} f(x) =$

$\lim_{x \to \infty} f(x) =$

Domain:

Range:

17) $d(x) = x^4 + x^3 - 4x^2 + 5$

$\lim_{x \to -\infty} f(x) =$

$\lim_{x \to \infty} f(x) =$

Domain:

Range:

18) $h(x) = -x^4 + 4x^2 + 3x - 4$

$\lim_{x \to -\infty} f(x) =$

$\lim_{x \to \infty} f(x) =$

Domain:

Range:

19). The height of a box is 3 cm less than the width. The length is 2 cm less than the width. The volume is 50 cm cubed. What is the width of the box? Also determine the height and length.

20) A box has the dimensions of x, 10-2x, and 12-2x. Find the maximum value of the box and the value of x that generates that volume.

Extra Practice: Factor (one of these is NOT factorable)

A) $14x^2 - 7x$ B). $x^2 - 36$ C) $x^2 + 16$ D) $x^2 - 5x - 36$ E). $2x^2 + 3x - 20$