

Mrs. DosSantos'

Common Core Algebra 2  
Regents Review

Session 1

Algebra II Regents Review: Session 1

1) Solve for all zeros of  $f(x) = x^4 - 4x^3 - 9x^2 + 36x$

2) Factor:

a)  $(x^2 + 3x + 1)(x^2 - 5x + 2)$

b)  $20n^3 - 15n^2 + 4n - 3$

c)  $2x^2 - 7x - 15$

Steps:

1. Multiply lead coefficient by the constant
2. Factor
3. Divide by the lead coefficient
4. Reduce where possible, move what remains in front of x

d)  $10x^2 + 3x - 1$

3) Perform the indicated operation and simplify completely:

$$A) \frac{x^3 - 3x^2 + 6x - 18}{x^2 - 4x} \cdot \frac{2x - 4}{x^4 - 3x^3} \div \frac{x^2 + 2x - 8}{16 - x^2}$$

$$B) \frac{x^2 - 5x}{x^2 - 9} \cdot \frac{x^2 - x - 12}{5 - x} \div \frac{x^2 - 8x + 16}{x - 4}$$

4) Use Synthetic Division to Solve:

$$\text{a) } \frac{2x^2 + x - 10}{x - 2}$$

$$\text{b) } \frac{2x^3 + 7x^2 - 5x - 4}{2x + 1}$$

$$\text{c) } \frac{x^4 - 3x^2 + 1}{x - 1}$$

5) Consider the polynomial  $P(x) = x^3 + kx^2 + x + 6$  find the value of  $k$  such that  $x+1$  is a factor of  $P$ .

6) Given  $i$  is the imaginary unit, express in simplest form:

a)  $(3 - yi)^2$

b)  $(-3 + \sqrt{-2})(3 - \sqrt{-32})$

7) Perform the indicated operation and express in simplest  $a+bi$  form.

a)  $(5 - i) + (7 + 4i) - (6 - 8i)$

b)  $(-3 - \sqrt{-100}) - (4 + \sqrt{-81})$

8) Rationalize the denominator:

a)  $\frac{3 - 4i}{2 + 2i}$

b)  $\frac{4}{\sqrt{5} - \sqrt{13}}$

9) The function  $f(x) = \frac{x-4}{x^2+2x-35}$  is undefined when x equals?

10) Perform the indicated operation:

$$\frac{9}{x^2+7x+10} + \frac{3}{x+5} - \frac{1}{x+2}$$

11) Determine the solutions set to  $b = \sqrt{j} - 2j + 6$  when  $b = 0$ .

12) Solve

a)  $\sqrt[3]{1-x} = \frac{1}{2}$

b)  $\sqrt{x-2} - 2\sqrt{x+8} = 0$

13) Solve the following system of equations algebraically:

$$4x + 5z - 6k = 2$$

$$-3x - 2z + 7k = -15$$

$$7x + 4z + 2k = -13$$

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Common Core Algebra 2  
Regents Review

Session 2



## Algebra II Regents Review: Session 2

1) The roots of the equation  $x^2 + 2x + 5 = 0$  are?

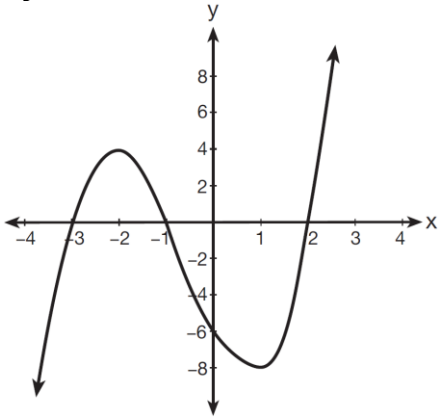
2) Write a quadratic equation given the following roots:

a)  $\{-7, -4\}$

b)  $\{2 + \sqrt{3}, 2 - \sqrt{3}\}$

c)  $\{6 + 3i, 6 - 3i\}$

3) What are the zeros of the polynomial function graphed below?



4) Solve the system of equations algebraically:

$$(x - 3)^2 + (y + 2)^2 = 16$$

$$2x + 2y = 10$$

5) The directrix of the parabola  $\frac{1}{12}(y + 3) = (x - 4)^2$  has the equation  $y = -6$ .

Find the coordinates of the focus of the parabola.

\*\*\*\*Remember\*\*\*\*(The distance to the focus = the distance to the directrix)

6) Let  $f(x) = 2x+3$  and  $g(x) = x-3$  and  $h(x) = x^2 + 5$

Find: (a)  $(f \circ f)(-4)$

b)  $(h \circ g)(x)$

c)  $(h \circ g \circ f)(-2)$

7) If  $g(x) = \sqrt{x}$  and  $h(x) = x^3 - 1$ , what is  $g(h(4))$ ?

8) What is the inverse of  $f(x) = -6(x - 2)$ ?

## Exponential Form

$$\text{base}^{\text{exponent}} = \text{number}$$

OR

$$b^e = n$$

## Logarithmic Form

$$\log_{\text{base}} \text{number} = \text{exponent}$$

OR

$$\log_b n = e$$

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9) Solve algebraically for all values of x:  $\log_{(x+4)}(17x - 4) = 2$

10) Solve algebraically for all values of x :  $2\log x - \log(x-1) = \log 4$

11) Solve the exponential equations:

a)  $2(4)^x = 18$

b)  $2^{x+1} = 85.6$

\*\*\*\*REMEMBER\*\*\*\*

Converting from Degrees to Radians, multiply by  $\frac{\rho}{180}$ . (Always reduce)

Converting from Radians to Degrees, multiply by  $\frac{180}{\rho}$ . (Round appropriately)

12) How many degrees (to the nearest degree) does 5 radians equal?

13) Find the exact value of  $4\cos\rho + 3\sin\frac{\rho}{2}$

14) If  $\sin A = -\frac{1}{2}$  and  $\sec A < 0$ , find  $\cot A$ .

15) The expression  $\frac{\cot x}{\sec x}$  is equivalent to?

16) Show that:  $\sin q + \cos q \cot q = \csc q$

17) Graph  $y = 3\sin 2x$  over the interval  $-\rho \leq x \leq \rho$ .

18) The hours of daylight,  $y$ , in Utica in days,  $x$ , from January 1, 2013 can be modeled by the equation  $y = 3.06 \sin(0.017x - 1.40) + 12.23$ . How many hours of daylight, to the *nearest tenth*, does this model predict for February 14, 2013?

19) Stop and Shop is conducting a consumer satisfaction survey. Which method of collecting data would most likely lead to a biased sample?

- |                                                                          |                                                                                                            |
|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| 1) interviewing every 5th customer to come into the store                | 3) interviewing customers who call an 800 number posted on the customers' receipts                         |
| 2) interviewing customers chosen at random by a computer at the checkout | 4) interviewing every customer who comes into the store on a day of the week chosen at random out of a hat |

