Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Block:\_\_\_

 Practice.

Test: Unit 6 and 11

Rational expressions + Polynomials

There are  **10 questions** in this quiz. Question number has larger weight.

Standard test time is **40 minutes**.

Four operations calculator is allowed.

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**Some reminders**

* $\frac{1}{2}+\frac{1}{3}=\frac{3+2}{6}=\frac{5}{6}$
* $\frac{1}{2}÷\frac{1}{3}=\frac{1}{2}⋅\frac{3}{1}=\frac{3}{2}$

======= Start of test

1. Simplify. Remember to note excluded values.

 $\frac{x^{2}+10x+25}{x^{2}-9}⋅\frac{x+3}{x+5}$

1. Simplify. Remember to note excluded values.

 $\frac{x^{2}+x-6}{x^{2}+6x+9}⋅\frac{\left(x+4\right)^{2}}{x^{2}+2x-8}$

1. Simplify. Remember to note excluded values.

 $\frac{x^{2}-36}{x^{2}-8x+16}÷\frac{3x-18}{x^{2}-x-12}$

1. Simplify. Remember to note excluded values.

 $\frac{2x-10}{x^{2}-25} - \frac{5-x}{25-x^{2}}$

1. Simplify. Remember to note excluded values.

 $\frac{x^{3}-8}{x^{2}-4x+4} – \frac{x^{3}+3x^{2}}{x^{2}+x-6 }-\frac{8}{x-2}$

1. Solve. Show your work!

 $\frac{x-2}{x+2} =\frac{2}{3}$

1. Solve. Show your work!

 $\frac{2x+3}{x-1} = \frac{10}{x^{2}-1}+\frac{2x-3}{x+1}$

1. Divide using long division.

$$(6x^{4}-x^{3}-21x^{2}+7x+5)÷(3x-5)$$

1. Divide using synthetic division.

$$(6x^{4}+2x^{2}-104)÷(x+2)$$

1. Given the expression:

$$9x^{2}+x^{4}+4x-6x^{3}-12$$

* 1. Write the polynomial in standard form

$P\left(x\right)=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. How many terms are there in $P\left(x\right)?$ \_\_\_\_\_\_\_\_\_\_\_
	2. What is the degree of the polynomial? \_\_\_\_\_\_\_\_\_\_\_
	3. What is the sign of the leading coefficient? \_\_\_\_\_\_\_\_\_\_\_
	4. What is the end behavior of the graph? \_\_\_\_\_\_\_\_\_\_\_
	5. It is given that the polynomial has a root at $x=3$, and another root at $x=2$ . Find the remaining roots of the polynomial (There’s a place to write these on the next page).

(Hint: Start by dividing with the root at $x=3$)

Roots:

1. \_\_\_\_\_\_\_\_ 4. \_\_\_\_\_\_\_\_\_\_\_\_

 2. \_\_\_\_\_\_\_\_

 3. \_\_\_\_\_\_\_\_

* 1. Write the polynomial in a factored form.

$P\left(x\right)=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. What is the y-intercept of the polynomial?

\_y-intercept = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Utilizing all the information gathered above (and only this information), plot P(x) in the graph below.



This is an extra question for practice. You MAY get a question like this in the test (namely, with complex root).

1. Given the expression:

$$3x\left(x^{2}-x\right)+x^{5}-x^{4}+4-4x$$

* 1. Write the polynomial in standard form

$P\left(x\right)=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. How many terms are there in $P\left(x\right)?$ \_\_\_\_\_\_\_\_\_\_\_
	2. What is the degree of the polynomial? \_\_\_\_\_\_\_\_\_\_\_
	3. What is the sign of the leading coefficient? \_\_\_\_\_\_\_\_\_\_\_
	4. What is the end behavior of the graph? \_\_\_\_\_\_\_\_\_\_\_
	5. It is given that the polynomial has a root at $x=1$, and another root at $x=-2i$ . Find the remaining roots of the polynomial (There’s a place to write these on the next page).

(Hint: Start by dividing with the root at $x=1$.)

Roots:

1. \_\_\_\_\_\_\_\_ 4. \_\_\_\_\_\_\_\_\_\_\_\_

 2. \_\_\_\_\_\_\_\_ 5. \_\_\_\_\_\_\_\_\_\_\_\_

 3. \_\_\_\_\_\_\_\_

* 1. Write the polynomial in a factored form.

$P\left(x\right)=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. What is the y-intercept of the polynomial?

\_y-intercept = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Utilizing all the information gathered above (and only this information), plot P(x) in the graph below.



===== End of test