5.

$$2x^3-4x^2-x+\frac{14}{x+6}$$

$$x+6\,\overline{)\,2x^4+8x^3-25x^2-6x+14}$$

$$\underline{-2x^4-12x^3}$$

$$-4x^3-25x^2-6x+14$$

$$\underline{4x^3+24x^2}$$

$$-x^2-6x+14$$

$$\underline{x^2+6x}$$

$$14$$

$$\begin{array}{r|rrrrr} -6 & 2 & 8 & -25 & -6 & 14 \\ & \downarrow & -12 & 24 & 6 & 0 \\ \hline & 2_{x^3} & -4_{x^2} & -1_{x} & 0 & \boxed{R14} \end{array}$$

$$
\begin{array}{r}
2x^3-3x^2-32x+48 \\
x+1\,\overline{)\,2x^4-x^3-35x^2+16x+48} \\
\underline{-2x^4-2x^3} \\
-3x^3-35x^2+16x+48 \\
\underline{3x^3+3x^2} \\
-32x^2+16x+48 \\
\underline{32x^2+32x} \\
48x+48 \\
\underline{-48x-48} \\
0
\end{array}
$$

$3x^2-32x+48=0$

$x-3)-16(2x-3)=0$

$$
\begin{array}{r|rrrrr}
-1 & 2^{x^4} & -1 & -35 & 16 & 48 \\
 & \downarrow & -2 & 3 & 32 & -48 \\
\hline
 & 2_{x^3} & -3 & -32 & 48 & \boxed{0}
\end{array}
$$

Regents Review #6 - Rationals & Functions

Warm-up: The expression $\frac{6x^3+17x^2+10x+2}{2x+3}$ equals:

1. $3x^2+4x-1+\frac{5}{2x+3}$
2. ~~2.~~ $6x^2+8x-2+\frac{5}{2x+3}$
3. ~~3.~~ $6x^2-x+13-\frac{37}{2x+3}$
4. $3x^2+13x+\frac{49}{2}+\frac{151}{2x+3}$

$$\begin{array}{r} 3x^2+4x-1 \\ 2x+3\,\overline{)\,6x^3+17x^2+10x+2} \\ -\,(6x^3+9x^2) \\ \hline 8x^2+10x \\ -\,(8x^2+12x) \\ \hline -2x+2 \\ +2x+3 \\ \hline 5 \end{array}$$

Solving Rational Equations: Review section ~~15~~ 12 Fractional Equations from ~~your Review Packet~~.

Example: Solve for x. $\frac{x}{x-2}-\frac{3}{3x+2}=\frac{8}{3x^2-4x-4}$

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

$3x+2\neq 0$, $3x\neq -2$, $x\neq -2/3$

$x\neq 2, -2/3$

$$\frac{(3x+2)(x-2)}{1}\left(\frac{x}{x-2}\right)-\frac{(3x+2)(x-2)}{1}\left(\frac{3}{3x+2}\right)=\frac{8}{(3x+2)(x-2)}\left(\frac{(3x+2)(x-2)}{1}\right)$$

$x(3x+2)-3(x-2)=8$

$3x^2+2x-3x+6-8=0$

$3x^2-x-2=0$

$(3x+2)(x-1)=0$

~~$x=-2/3$~~ Reject | $x=1$

$\{1\}$

Fix this typo from Review Packet:

Even → Symmetrical with respect to y-axis
$f(-x) = f(x)$; same

Box 4

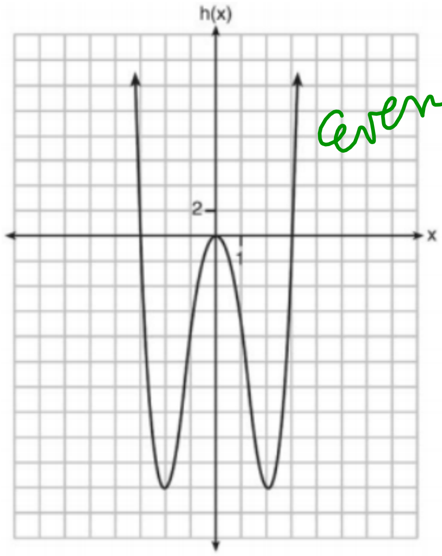
Even and Odd Functios: Review section ~~6~~ 4 Even and Odd from your Review Packet.

Functions f, g, and h are given below.

$f(x) = \sin(2x)$ odd

$g(x) = f(x) + 1$

neither



even

Which statement is true about functions f, g, and h?

1. f(x) and g(x) are odd, h(x) is even
2. f(x) and g(x) are even, h(x) is odd
3. f(x) is odd, g(x) is neither, h(x) is even
4. f(x) is even, g(x) is neither, h(x) is odd

Regents Review #7 -

- Inverse of functions
- Sequence and Series (Explicit/Recursive)
- Summation Notation

Finding an Inverse:

A. From a table: switch x and y coordinates

B. From a graph: reflection across the line $y=x$

* C. From a function:

a. Replace f(x) with y

b. Switch the x and y

c. Solve for y

d. Replace y with $f^{-1}(x)$ (only if it is a function)

D. The inverse of an exponential function is a log function.

Sequence and Series:

A sequence is a list of numbers, whereas a series is the sum of the list of numbers.

Arithmetic Sequence Formula: $a_n = a_1 + d(n-1)$ * ON REF SHEET!

Geometric Sequence Formula: $a_n = a_1 r^{n-1}$ * ON REF SHEET!

Geometric Series Formula: $S_n = \frac{a_1(1-r^n)}{1-r} = \frac{a_1 - a_1 r^n}{1-r}$ * ON REF SHEET!

Explicit Formula: based only on the term number (n). Ex: ______

Recursive Formula: based on the previous term(s). a_{n-1} means the term before a_n.

You must have a previous term(s) (such as a_1) in order to be able to write a recursive formula.

Ex: $a_1 = 7 \quad a_n = 3a_{n-1} + 2$

1. The population of Jamesburg for the years 2010 - 2013, respectively, was reported as follows:

250,000, 250,937 251,878 252,822

How can this sequence be recursively modeled?

~~1.~~ $j_n = 250{,}000(1.00375)^{n-1}$

~~2.~~ $j_n = 250{,}000 + 937^{n-1}$

3. $j_1 = 250{,}000$
$j_n = 1.00375 j_{n-1}$

~~4.~~ $j_1 = 250{,}000$
$j_n = j_{n-1} + 937$

$$\begin{array}{r} 252822 \\ -251878 \\ \hline 944 \end{array}$$

2. The eighth and tenth terms of a sequence are 64 (a_8) and 100 (a_{10}). If the sequence is either arithmetic or geometric, the ninth term can **NOT** be

1. -82
~~2. -80~~
~~3. 80~~
~~4. 82~~

A

$a_{10} = a_8 + 2d$

$100 = 64 + 2d$

$36 = 2d$

$18 = d$

$a_9 = 64 + 18 = 82$

G

$a_{10} = a_8 r^2$

$100 = 64 r^2$

$\sqrt{\frac{100}{64}} = \sqrt{r^2}$

$\pm \frac{5}{4} = r$

$a_9 = 64\left(\pm \frac{5}{4}\right) = \pm 80$