Name____________________

Pre-Calculus Honors — **Ms. Hindal**
Unit 1 and 3 Review — **Review Day 4**

Do Now:

1. Does the following converge:
   4 + 3/2 + 9/16 + 27/128 + ...

   yes! $r = 3/8$

2. What is the sum of the above?

   $S = \frac{a_1}{1-r} = \frac{4}{1-3/8} =$

   $\frac{4}{3/8} = 4 \cdot 8/3 = \boxed{6.4 \text{ or } \frac{32}{5}}$

3. What is the domain of f(x) = (x + 2)/(x² – 9)?

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

   function undefined when x = 3 or -3
   exists everywhere else:
   domain: $(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$

Practice:
Last Year's Final:

#6

$P(T(3)) - T(P(3)) =$

$P(-3) - T(10(3) + 2) =$

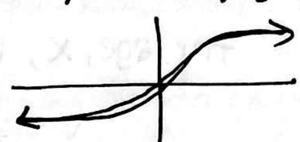
$P(-3) - T(32) =$

$(10(-3) + 2) - (-32) =$

$-30 + 2 + 32 = \boxed{4} \rightarrow \boxed{B}$

#15

graph $y = \tan^{-1}(x)$



looks like there are asymptotes!
so $-\frac{\pi}{2} < y < \frac{\pi}{2}$ because
we aren't able to get to $\frac{\pi}{2}$ also,
$\tan(\pi/2) = \text{undef} \rightarrow \boxed{A}$

#23

$x \cdot y = \frac{2.5x + 1}{x} \cdot x$

$xy = 2.5x + 1$

$xy - 2.5x = 1$

$x(y - 2.5) = 1$

$x = \frac{1}{y - 2.5} \rightarrow f^{-1}(x) = \frac{1}{x - 2.5}$

$\boxed{A}$

#24

\$50 = one week
\$5 · 10 = days 1 – 10 late
\$8 · 5 = days 11 – 15 late

50 + 50 + 40 = \$140

$\boxed{C}$

Free Response #1

$y = ax^2 \Leftrightarrow y = \frac{1}{4c}x^2$

$\frac{1}{4c} = \frac{1}{18} \Rightarrow 4c = 18 \quad c = \frac{18}{4}$ = focal length

a. focal width = 4 · focal length = $18/4 \cdot 4 = \boxed{18}$

b. you must look at the coefficient.
the coefficient is always equal to $\frac{1}{4 \cdot \text{focal length}}$
or $\frac{1}{\text{focal width}}$

1. *(1.5) Regression:* **Name________________________**

An individual's income varies with his or her age. The following table shows the median income of individuals of different age groups within the United States.

Average Age	Income
20	$28810
30	$48230
40	$59696
50	$67830
60	$53508
70	$26126

a) **Create a scatter plot of this data. What type of parent function might make sense for the regression based on the shape of the data and why?**

enter data in lists under STAT, turn on stat plot, zoom stat — square function (quadratic regression) → looks like a parabola

b) **Construct your suggested regression and write the equation, rounding to the nearest whole number:**

$y = -60x^2 + 5449x - 58{,}349$

c) **In terms of the problem, what would the zeros of your model represent?** $y=0$

the age, x, when you were expected to make "0" money, y.

d) **Construct a linear regression and write the equation, rounding to the nearest whole number:**

$y = 30x + 46{,}010$

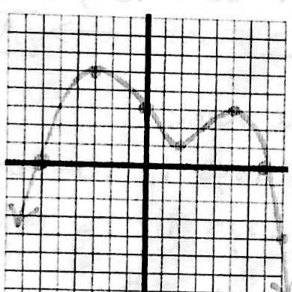
e) **Does your regression or the linear regression make more sense and why?**

my regression → better r^2/r and fits the shape of the data on scatter plot better

Use the following scenario for questions 2 and 3:

A portion of the graph of the function *f(x)* is shown in the xy - plane. Selected values of a linear function *g(x)* are shown in the table. The equation for *h(x)* is *h(x) = 3x/(x – 2).*

f(x)



x	g(x)
-4	7
-1	1
2	-5
5	-11

2. **(1.1) *Function notation*: fill in the blank with <, >, or = for the following comparisons**

a. $\frac{f(5)-f(2)}{5-2}$ __>__ $\frac{g(5)-g(2)}{5-2}$ $\frac{3-1}{5-2} = \frac{2}{3}$ $\frac{(-11)-(-5)}{5-2} = \frac{-6}{3}$

b. g(3) __<__ h(3) g(x) linear → between −5 and −11 when x = 3

$h(3) = \frac{3(3)}{3-2} = \frac{9}{1} = 9$

3. **(1.3) *Properties of functions*: fill in the blank with <, >, or = for the following comparisons**

a. Maximum value of *f(x)* on the interval $-5 \le x \le 5$ __<__ Maximum value of *g(x)* on the interval $-5 \le x \le 5$

5 more than 7

b. The y-coordinate of the y-intercept of *f(x)* __>__ The y-coordinate of the y-intercept of *g(x)*

3 ↓ between 1 and −5; x=0

c. $\lim_{x \to -\infty} f(x)$ __<__ $\lim_{x \to \infty} h(x)$

$-\infty$ 3

d. Is g(x), even, odd, or neither? How do you know?

neither. if you graph the pts, its not symmetrical

Homework: Study!!