Exam Review Day 1
Work through these questions at whiteboards

1. Simplify Completely. Be sure to state restrictions on the variable.

$$\frac{x^2-9}{4x+12}+\frac{8x^2+16x}{x^2-x-6}\div\frac{2x}{x-3}$$

2. Determine the production level required for maximum profit. What is the maximum profit? Given: P(x) = -3x(x-50)+1000, where x is the number of items produced and P(x) is the profit in dollars.

3. Given the parent function, $f(x)=\frac{1}{x}$ and the transformation described as $y=-2f(x+4)-5$ Write the image equation and state the domain and range of both the parent function and the image equation.

4. Simplify, leave no negative exponents.

$$\left(\sqrt[5]{\frac{-32x^{-4}}{x^{21}}}\right)^3$$

5. Find all values of A, given
$-180° \leq A \leq 720°$

$$cscA=-\sqrt{2}$$

6. High tide is at 4 a.m. when the water is 6 m deep. Low tide is at 8 a.m. when the water is 1 m deep.
   a) Determine the following:
   Maximum: Minimum: Amplitude:
   Period: Equation of Sinusoidal Axis: Phase Shift:
   b) Construct a model for the height of the function over time using a cosine function, where *t* is the time in hours since 4 a.m. and *H(t)* is the height of the water, in metres.
   c) Construct a model for the height of the function over time using a sine function, where *t* is the time in hours since 12 a.m. and *H(t)* is the height of the water, in metres.

7. In a geometric sequence, $t_5 = 162$ and $t_{10} = 39366$. Find an expression for the *n*th term.

8. $440 grew to $505.45 at 3.5%/a simple interest. For how long was the money invested?

9. $5000 is invested at 4.3%/a compounded weekly for 18 months. How much interest is earned on the investment?