Instructions: *Complete these problems for homework due on the date above. The problems should look very similar to those that were covered during our class meeting covering Ch. 8 & 12. As always show all work and please box your final answer.*

1.   Factor each of the following completely.

a) $75x^2yz - 30xy^2 + 15x^3y^3z$

b) $x^3 - 125$

c) $8xy - 3x - 24y + 9$

d) $x^2 + 5x - 24$

e) $-5x^3 + 15x^2 + 350x$

f) $54x^3 + 2y^6$

g) $x^2(y - 3) - 20x(y - 3) + 100(y - 3)$

h) $4x^2 + 9$

i) $8x^2 - 31x - 45$

j) $25x^2 - 64$

2. Simplify the rational expression: $\dfrac{8xy - 3x - 24y + 9}{x^2 + 5x - 24}$

3. Find the restrictions for: $\dfrac{1}{8x^2 - 31x - 45}$
   Use set builder notation.

4. Subtract & Simplify: $\dfrac{5x}{25x^2 - 64} - \dfrac{8}{25x^2 - 64}$

5. Solve the quadratic equation using the **zero factor property**: $x^2 - 20x = -100$

6. Find the LCD for: $x^3 - 125$ & $4x^2 - 52x + 160$