Math 80 Quiz #8 Answers

1. (a) The GCF of both terms is $4xy^2$. $\Rightarrow$ $8xy^2 + 12x^2y^7 = \boxed{4xy^2(2 + 3xy^5)}$

   (b) Note: The GCF between all three terms is 1, so we do not need to factor out the GCF first.

   Since $t^2+9t+20$ is a trinomial of degree two, if it factors, it will factor into two binomials: $(t+?)(t+?)$

   Need: Two numbers that multiply to 20 and add to 9 $\rightarrow$ $5, 4$

   $$\Rightarrow \quad t^2 + 9t + 20 = \boxed{(t + 5)(t + 4)}$$

   (c) Note: The GCF between all three terms is 1, so we do not need to factor out the GCF first, but we can factor out a -1 so that the coefficient of m^2 is 1. $\Rightarrow$ $-m^2 + 5m + 14 = -(m^2 - 5m - 14)$

   Since $m^2 - 5m - 14$ is a trinomial of degree two, if it factors, it will factor into two binomials: $(m+?)(m+?)$

   Need: Two numbers that multiply to -14 and add to -5 $\rightarrow$ $-7, 2$

   $$\Rightarrow \quad -m^2 + 5m + 14 = -(m^2 - 5m - 14) = \boxed{-(m - 7)(m + 2)}$$

   (d) Note: The GCF between all three terms is 9x. $\Rightarrow$ $9x^3 - 18x^2 + 9x = 9x(x^2 - 2x + 1)$

   We can factor this even further since $x^2 - 2x + 1$ factors into $(x - 1)(x - 1)$.

   $$\Rightarrow \quad 9x^3 - 18x^2 + 9x = \boxed{9x(x - 1)(x - 1) \quad \text{or} \quad 9x(x - 1)^2)}$$

   (e) Note: The GCF between all three terms is 1, so we do not need to factor out the GCF first.

   Since $5x^2 + 12x + 4$ is a trinomial of degree two, if it factors, it will factor into two binomials: $(?x + ?)(?x + ?)$

   You can use the guess and check method to find how it factors or you can use the other method involving factoring by grouping, which is shown below.

   Multiplying 5 and 4, we get 20. Now we need two numbers that multiply to 20 and add to 12 $\rightarrow$ $10, 2$

   $$\Rightarrow \quad 5x^2 + 12x + 4 = 5x^2 + 10x + 2x + 4$$

   $$= 5x(x + 2) + 2(x + 2) \qquad \text{(Factoring by grouping)}$$

   $$= \boxed{(x + 2)(5x + 2)}$$