

Name: _____

Directions: Show all work.

1. Graph Ramsey Numbers.

(a) [**3 points**] Prove that $r(P_4, C_4) > 4$.(b) [**4 points**] Prove that $r(P_4, C_4) \leq 5$.2. [**3 points**] Using that $r(3, 4) = 9$ and $r(3, 3, 3) = 17$, apply the multicolor Ramsey Theorem to give an upper bound on $r(3, 3, 4)$.