	Max	Pts.	Notes to markers
Application of Course Concepts:	***45***		**Total is 50, which is >45 to account for answers with varying strengths. Record at most 45 in this space.**
1. Demonstrates understanding of why these data are observational; *applies* concepts to happiness/GDP context	***4***		**4** – "Excellent," **3** – "Good," **2** – "Marginally Passing," **1** – "Poor," **0** – "No idea/Not Addressed"
2. Demonstrates understanding of cross-sectional and panel data and correctly *applies* it to this case: while underlying data are panel, Regressions 1, 2, and 4 are based on cross-sectional data and one can argue either panel or cross-sectional for Regression 3	***3***		Award only **2** points for correct abstract description of panel and cross-sectional but failure to apply it (or to apply it correctly) to this specific happiness & GDP context.
3. Recognizes that the important violation of underlying conditions is the non-linearity in Regression 1	***2***		Award **1** point if misses this but identifies symptoms of this violation: apparent outliers and heteroskedasticity. Note: There is *no* violation of the quantitative variable condition.
4. Demonstrates understanding of the non-linearity: that there is evidence consistent with DMRs to wealth and that wealth and happiness should be described as associated (not correlated) b/c of the non-linearity; Log transformation does *not* get rid of DMRs.	***4***		DMRs = Diminishing Marginal Returns; Reserve a mark of **4/4** for those who also realize that DMRs do NOT disappear when you apply the log transformation.
5. Demonstrates ability to *interpret* a slope correctly in a linear-linear specification: requires specifying the units of measurement, being clear on causality, recognizing scatter (e.g. by saying on average), and what is the x and y variable. Regressions 1 & 3 are linear specifications.	***5***		**5** – "Excellent," **4** – "Good," **3** – "OK," **2** – "Poor," **1** – "Very Poor," **0** – "No idea/Not addressed"
6. Demonstrates ability to *interpret* an intercept correctly: only in Regression 1 is a value of 0 outside the range of data (and non-linear), for other 3 *can* interpret intercept. Units and scatter must be recognized.	***4***		**4** – "Excellent," **3** – "Good," **2** – "Marginally Passing," **1** – "Poor," **0** – "No idea/Not addressed"
7. Demonstrates ability to *interpret* an R^2 correctly: unit-free, no direction, measure of strength of linear relationship, not causal, and what percent of variation in LHS variable explained by variation in RHS variable	***5***		**5** – "Excellent," **4** – "Good," **3** – "OK," **2** – "Poor," **1** – "Very Poor," **0** – "No idea/Not Addressed"
8. Correctly interprets the "slope" in Regression 2 or 4 (linear-log specification). In Regression 2, a one percent increase in GDP per capita is associated with an increase of 0.007 in happiness as measured on a 0 to 10 scale.	***2***		Do not need to interpret both Regression 2 and 4 to earn **2/2**, but s/he should not contradict her/himself. **1** point if otherwise correct but did not divide by 100.
9. Recognizes that Regressions 2 & 4 are very, very similar	***2***		**1** point if they may recognize this but it is not fully clear
10. Points out that Regression 3 shows an extremely weak relationship whereas Regression 4 shows a clear positive relationship.	***3***		Note: Later in the rubric we assess whether s/he provides the context and notes the disparity in the cross-sectional versus time-series patterns.
11. Demonstrates understanding that "does increased wealth lead to increased happiness?" is a causal question that cannot be answered with these observational data and gives valid examples of lurking/unobserved/confounding variables	***7***		Of the **7** points, allocate **2** for correct identification of plausible lurking variables in this case. For the remaining **5** points: **5** – "Excellent," **4** – "Good," **3** – "OK," **2** – "Poor," **1** – "Very Poor," **0** – "No idea/Not addressed"
12. Explains the apparent paradox: Regression 3 shows the countries that become richer do not seem to become happier even though Regression 4 shows that richer countries tend to be happier than poorer ones.	***6***		**6** – "Excellent," **5** – "Very Good," **4** – "Good," **3** – "OK," **2** – "Poor," **1** – "Very Poor," **0** – "No idea/Not addressed"
13. Recognizes that relying on observational data can yield paradoxical results like these	***3***		Likely most papers get a **0** or **3**: reserve in between marks for rare cases where you are left guessing
Writing: Are arguments well-structured and coherent: is it obvious how each paragraph relates back to the main question? Is the message clear and concise?	***5***		**5** – Yes! (excellent conditional on 90 mins.); **4** – Writing occasionally detracting from your comprehension; **3** – Writing detracting at several points but s/he is clearly trying to make her/himself understood; **2** – Writing frequently an impediment to your comprehension but s/he appears to be trying to make her/himself understood; **1** – Writing is major impediment for your comprehension throughout; **0** – Entirely incomprehensible