

# Problem Set 1

Due 11:59PM on Friday, February 22, 2013.  
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Type your answers for the following questions in a word processor; we will accept Word Documents (.doc, .docx), PDF documents (.pdf), or plaintext files (.txt, .rtf). If you prefer, you may write out the problems on a sheet of paper, scan that, and submit the scanned document as a PDF. Before the due date, place the file into your "**Problem Set 1**" folder in the submission tool.

1. (25 points) Name and explain the four factors that affect exposure. What is the relationship between all four factors and exposure? Be sure to explain the complex relationships among them; how does each affect exposure when the factor is increased and decreased, assuming other factors remain constant? How must each change (if possible) to compensate for other factors? How does each impact the appearance of each photograph when the factor is increased and decreased, assuming the exposure is able to remain the same? What other consequences, if any, must the photographer acknowledge when modifying each factor? You may find creating a table helpful in answering this question.
2. (20 points) Give two reasons why it is a good idea to shrink the size of a photograph when it is to be sent via email or posted to a website. What is a reasonable resolution to export your photograph when sending one via email?
3. (15 points) Suppose there is a properly exposed photograph that was taken outdoors using the "Sunny 16" rule and then another properly exposed photograph is taken indoors at 1/50 of a second at f/2.8 using ISO 800. How many stops darker is it indoors than outdoors?
4. (10 points) Some conspiracy theorists claim that the moon landings were fake because, among other things, there are no stars in the backgrounds of photographs allegedly taken on the moon. Their explanation is that the thinner atmosphere on the moon would make stars visible in photographs. Write an explanation no longer than a few sentences to support or refute this evidence based on your knowledge of exposure. Can this evidence be reasonably used as proof for the theory that the moon landings were fake?
5. (10 points) Calculate the minimum and maximum f-number of the human eye. Assume a focal length of 22mm, a minimum diameter of 2mm, and a maximum diameter of 7mm. Be sure to show all work for full credit.
6. (10 points) An SLR has a mirror that reflects light coming from the lens into the viewfinder so that the photographer can see a preview of the photo before it is taken. In order for a camera to take a photograph, however, the camera must move the mirror up before opening the shutter to expose the sensor. If the mirror prevents light from reaching the sensor, why does an SLR also have a mechanical shutter?
7. (10 points) How many stops brighter is ISO 102,400 compared to ISO 100? How many times faster is it?