For full credit, put your name, and the homework number in the upper right-hand corner of your solutions. Staple multiple sheets together so nothing gets lost. Always show your work and explain how you got your answer, and be careful about units. Please put a box around your final answer if it is numerical. Unless otherwise stated, all page numbers and questions refer to *The Cosmos, by Pasachoff & Filippenko, THIRD EDITION.*

Every question is worth 4 points, so the total homework is out of 64 points.

### Chapter 15

(1) page 364, question 5
(2) page 364, question 6
(3) page 364, question 7
(4) page 364, question 14

### Chapter 16

(5) page 394, question 1
(6) page 394, question 6
(7) page 394, question 8
(8) page 394, question 23
(9) page 394, question 24

### Chapter 18

(10) page 451, question 5
(11) page 451, question 15
(12) page 451, question 18
(13) page 452, question 22

### Chapter 19

(14) page 479, question 3
(15) page 479, question 6
(16) page 479, question 11