Parallax, Distance Modulus and Stellar Distances

Name_____

Purpose:
- To provide you with necessary skills to understand the concept of stellar parallax and how this is used to determine distance
- To give you practice performing simple mathematical calculations using parallax and distance brightness

Estimated Completion Time: 45 minutes

Resources needed:
- Calculator (preferably scientific)
- Textbook
- Web access is highly desirable

Questions

1. Refer to sections 8.1,8.2 in the on-line notes. Summarize in your own words (3 sentences or less) what parallax is. Use a simple sketch to help explain the concept. (2 marks)

2. Star A has a parallax that is 3 times bigger than the parallax of star B. Which star is farthest from you and by what factor? (2 marks)

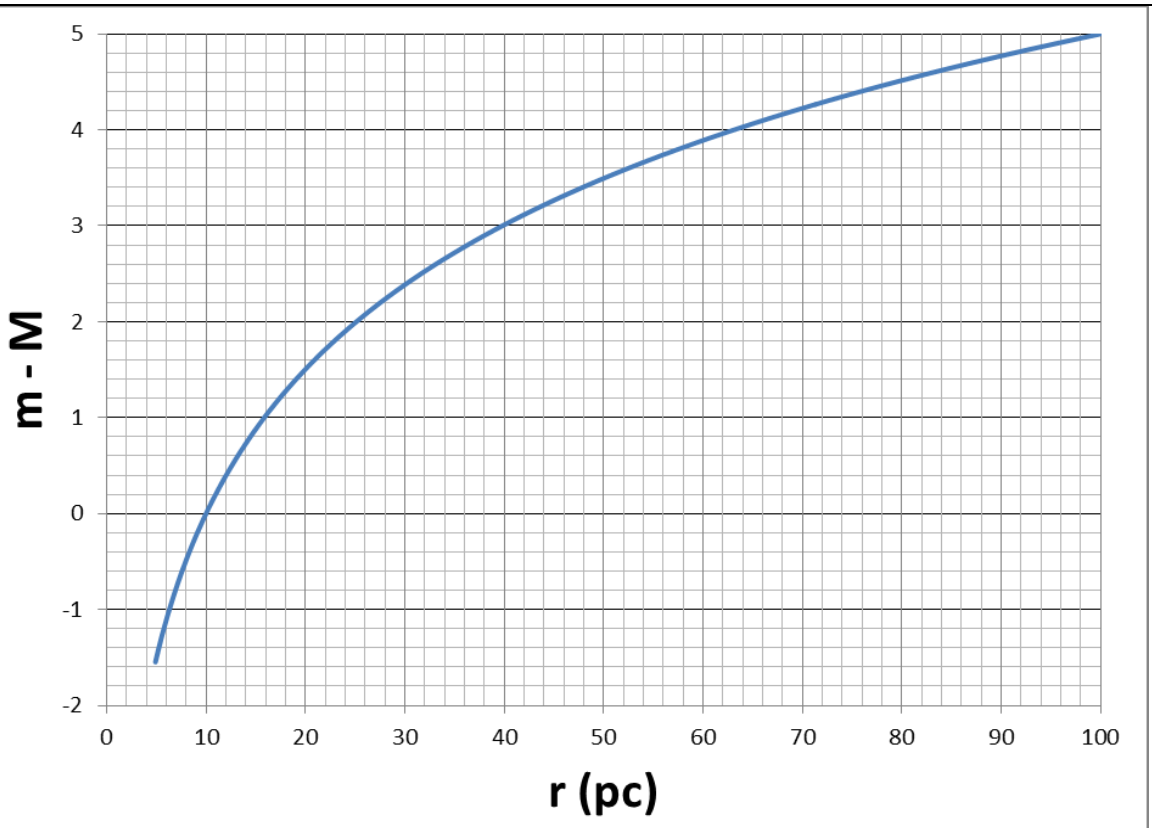
3. Explain what a distance of 1 parsec is. How is the unit “light year” related to parsec? (2 marks)

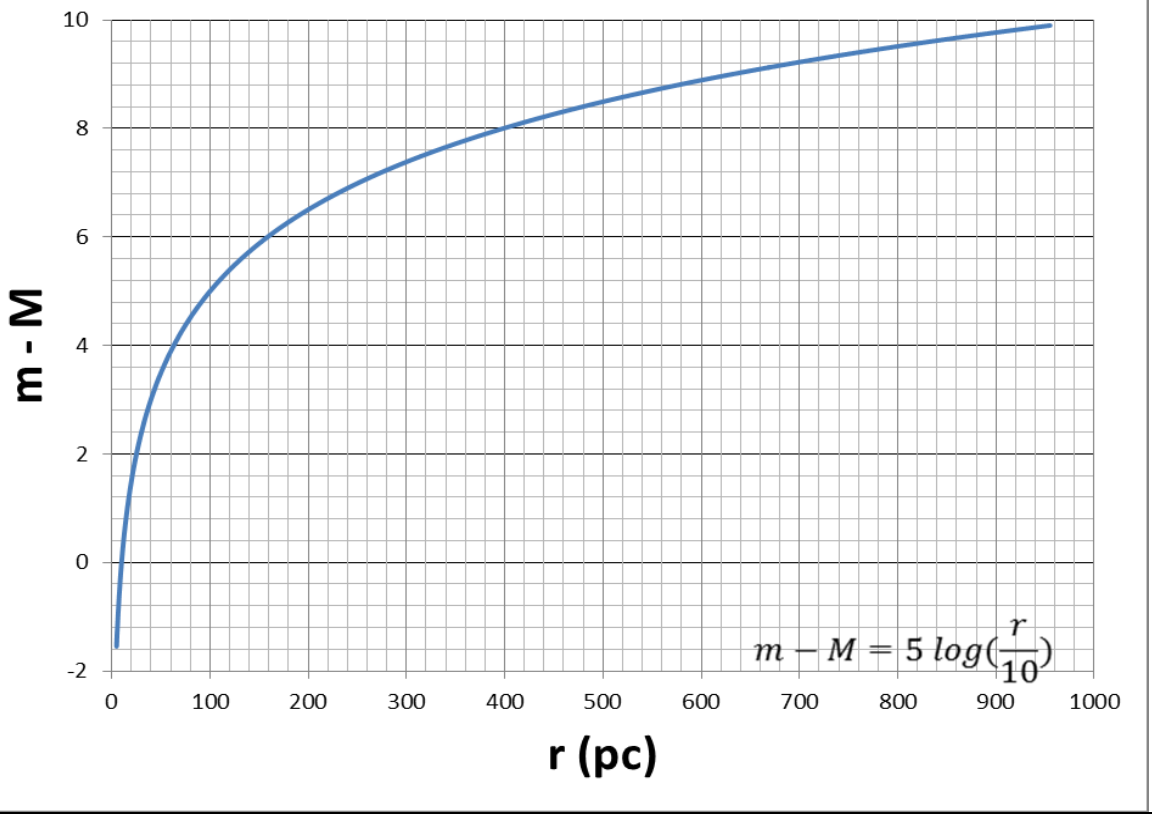
4. Explain in your own words what a distance modulus is and how it relates to distance. (2 marks)

5. Fill in the missing information for the table shown below: (18 marks)

Star	p (“)	Distance (pc)	Apparent Magnitude	Absolute Magnitude	Distance Modulus
Alnilam	.0047		1.7		
Arcturus				-2.25	2.25
Polaris			2.0	-3.6	
Alpha Centauri	0.797			5.71	
Mirphak	0.0064		1.8		
Mintaka	0.0047		2.5		

(Show your work below!)


m - M
r (pc)
5
4
3
2
1
0
-1
-2
0
10
20
30
40
50
60
70
80
90
100


m - M
r (pc)
$m - M = 5\ log(\frac{r}{10})$
10
8
6
4
2
0
-2
0
100
200
300
400
500
600
700
800
900
1000