**QUESTION 1**

1. In an experiment, you take the following four measurements of an object's apparent shift (parallax) against a background grid:  
     
   Measurement 1: distance = 0.25 m, apparent shift = 27.7 cm  
   Measurement 2: distance = 0.50 m, apparent shift = 10.5 cm  
   Measurement 3: distance = 0.75 m, apparent shift = 3.8 cm  
   Measurement 4: distance = 1.00 m, apparent shift = 2.4 cm  
     
      
   Which of the following graphs represents your measurements?

|  |  |  |
| --- | --- | --- |
|  |  | 1 |
|  |  | 2 |
|  |  | 3 |
|  |  | 4 |

**10 points**

**QUESTION 2**

1. To measure the parallax of a nearby star, the star must be observed twice from Earth in a time interval of \_\_\_.

|  |  |  |
| --- | --- | --- |
|  |  | 3 months |
|  |  | 6 months |
|  |  | 9 months |
|  |  | 12 months |

**10 points**

**QUESTION 3**

1. Although the Moon never stops in its orbit around Earth, it is possible to get an exact measurement of its parallax and thus its distance at any given moment. What would we have to do to get the parallax shift of the Moon?

|  |  |  |
| --- | --- | --- |
|  |  | Take simultaneous measurements from two locations. |
|  |  | Take two measurements at different times from one location. |
|  |  | Take two measurements from the same location at the same phase of the Moon, separated by 1 month. |

**10 points**

**QUESTION 4**

1. Suppose astronomers put a telescope on Pluto, ~40 AU from the Sun, beaming back information to us. How much **farther**will they be able to measure accurate parallaxes compared to their work here on Earth?

|  |  |  |
| --- | --- | --- |
|  |  | 20 times farther |
|  |  | 30 times farther |
|  |  | 40 times farther |
|  |  | just as far as from Earth |

**10 points**

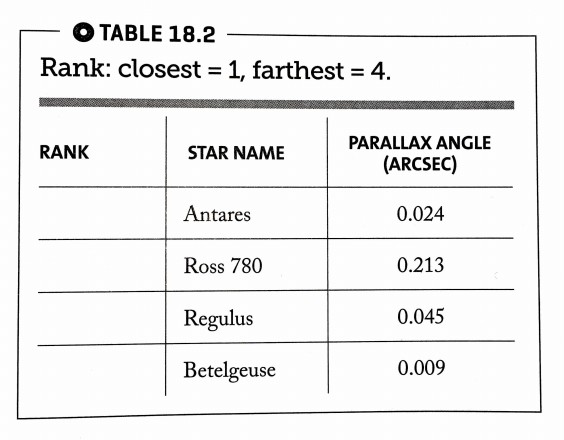
**QUESTION 5**

1. Imagine that you measure the parallax of two stars in the constellation Leo. Regulus has one-half the parallax angle of Denebola. What do you immediately know about the relative distances of these stars from Earth?

|  |  |  |
| --- | --- | --- |
|  |  | Both stars are at the same distance from Earth. |
|  |  | Regulus is twice as far away from us as Denebola. |
|  |  | Denebola is twice as far away from us as Regulus. |
|  |  | The relative distances cannot be determined with the information given. |

**10 points**

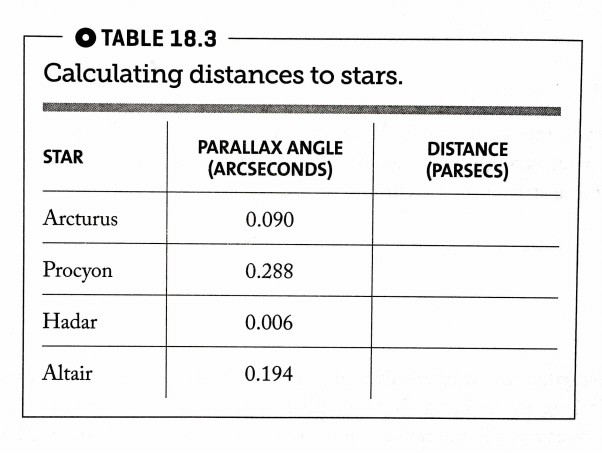
**QUESTION 6**

1. Rank the stars in Table 18.2 in order of distance from Earth (closest = 1, farthest = 4).  
   

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | |  | Antares | |  | Ross 780 | |  | Regulus | |  | Betelgeuse | | |  |  | | --- | --- | | A. | 1 | | B. | 2 | | C. | 3 | | D. | 4 | |

**10 points**

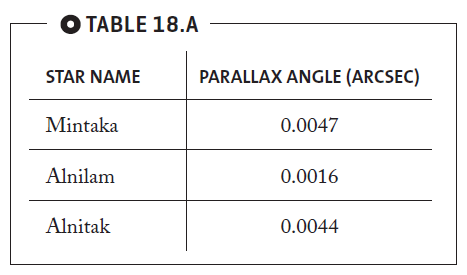
**QUESTION 7**

1. Match the stars in Table 18.3 with their corresponding distances.  
   

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | |  | Arcturus | |  | Procyon | |  | Hadar | |  | Altair | | |  |  | | --- | --- | | A. | 3.47 pc | | B. | 5.15 pc | | C. | 11 pc | | D. | 167 pc | |

**10 points**

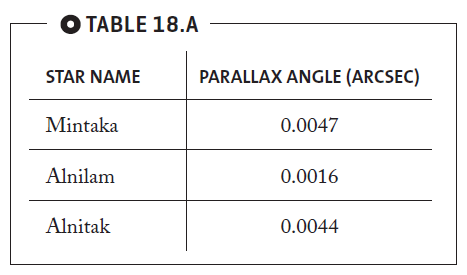
**QUESTION 8**

1. Table 18.A lists the three stars of Orion's belt. Which of the following ranks these stars from nearest to farthest?  
   

|  |  |  |
| --- | --- | --- |
|  |  | Mintaka, Alnilam, Alnitak |
|  |  | Alnilam, Alnitak, Mintaka |
|  |  | Mintaka, Alnitak, Alnilam |

**10 points**

**QUESTION 9**

1. Alnilam is approximately how many times farther away from us than Mintaka?  
   

|  |  |  |
| --- | --- | --- |
|  |  | 3 |
|  |  | 7 |
|  |  | 10 |
|  |  | 100 |

**10 points**

**QUESTION 10**

1. The parallax for the star Sirius in the constellation of Canis Major is 0.379 arc seconds; the parallax for the star Rigel in the constellation of Orion is 0.00378 arc seconds. Approximately how much farther away from us is Rigel than Sirius?

|  |  |  |
| --- | --- | --- |
|  |  | 10 times farther |
|  |  | 100 times farther |
|  |  | 1000 times farther |