Be able to do calculations without a calculator using powers of ten notation, and also to handle the units correctly.
Understand each of the Homework exercises.
What do the stars in a given constellation have in common?
If an observer is at a given latitude how many degrees is Polaris above the horizon?
From what direction does the Sun rise as seen from the northern hemisphere?
From what direction does the Moon rise as seen from the southern hemisphere?
Approximately how many degrees does the Earth spin on its axis in 24 hours?
What are the approximate dates of the equinoxes and solstices?
In its orbit around the Sun how many degrees and in which direction does the Earth move?
Why is the period of daylight longer in summer than in winter?
Why do we see different constellations at night in summer and winter?
In Honolulu, at latitude ~20 degrees North, how many days a year will the Sun be at an observer’s zenith as it crosses the observer’s meridian?
The plane of the Moon’s orbit about the Earth is tilted at approximately what angle to the Ecliptic?
How much time does it take for the Earth to spin on its axis one degree?
How much difference in time is there between a sidereal and a solar day?
At full moon, as seen from the Earth, what are the directions to the Sun & Moon?
Approximately what time of day is it if you see a full moon overhead?
What is the apparent retrograde motion of the planets?
What conditions are required in order to have a total lunar eclipse?
At what latitude should an observatory be located so that the greatest number of stars is observable over the course of a year?
What is the difference between a sidereal and a synodic month?
Give two reasons why it is warmer in summer than in winter.
Which side of your house, (north, east, south, west) gets the most exposure to sunlight?
If a star is on your meridian tonight at 2:00 am, when do you expect it to be on the meridian next month?
If a constellation is at your zenith at midnight on the 1st of June, approximately where will it be in the sky at midnight on 1st September? On 1st March? On 1st December?
Be able to use a figure like Fig. 2.12 on page 33 of the Text to answer questions such as which constellation of the Zodiac is on your eastern horizon, western horizon, or meridian at noon, sunset, midnight, or sunrise.
What conditions are required for a solar eclipse?
As the Moon orbits the Earth it always keeps the same face toward the Earth. If you were to live on the Moon, how long would a solar day be (i.e. from sunrise to sunset) on the Moon?
What is the angle between the plane of the Earth’s orbit about the Sun and the celestial equator?
What is the interest for astronomy of Babylonian cuneiform tablets?
Why did the Babylonians need good celestial forecasting?
What was the Babylonian technique for celestial forecasting?
What fundamental scientific concept do we owe to the Greek natural philosophers ca. 600-500 B.C.?
What was Anaximander’s explanation for the Sun, Moon, and stars?
How did the Pythagoreans hope to express underlying unity in nature?
What were the characteristics of natural motion on Earth for Aristotle?
What were the characteristics of natural motion in the Heavens for Aristotle?
How did Aristotle improve Plato’s model for the solar system?
How did Ptolemy’s model account for retrograde motion of the planets?
What was the importance of Alexandria in the ancient world?
What was the attitude of the Arabs toward the knowledge of cultures they conquered in the Middle Ages?
Why did the Islamic culture need astronomers?

Compare the sophistication of civilization in western Europe (say Paris or London) with that in the Middle East (say Baghdad) in 1000 A.D.

How did scholars in western Europe in the Middle Ages become aware of the classical authors such as Aristotle and Plato?

What was the Great Chain of Being?

How did astronomy fit into the Great Chain of Being and the medieval world-view?

According to the medieval European world view, by what authority did a king rule?

Was the idea that all men are created equal part of the medieval world?

In what century did Copernicus live?

What was Copernicus' motivation for developing his model of the Heavens?

How did Copernicus' model for the Solar System differ from Ptolemy’s?

How accurate was Copernicus’ model compared to Ptolemy’s model in predicting the future positions of planets?

What was the response to Copernicus' model?

In what way was Kepler like the Pythagorean natural philosophers?

What are Kepler's three laws of planetary motion?

If a planet has an orbit radius of 10 AU, what is the period of its orbit?

If a comet is discovered orbiting the Sun with an orbital period of 10 years, what is the radius of its orbit?

What new intellectual problem resulted from Kepler's laws of planetary motion?

Who was the first astronomer to use a telescope?

How did Galileo’s discoveries fit with the Ptolemaic model of the heavens?

What did Galileo argue was the relation between Science and the Bible?

In what century was Newton’s book, the Mathematical Principles of Natural Philosophy, published?

What was Newton’s theory for the natural motion of an object?

What was Newton's second law of motion?

What direction should the force on a planet be so that it moves in its orbit round the Sun?

Mars is significantly smaller than the Earth and it has relatively little atmosphere compared to the Earth. Which of Newton’s laws is most likely to help in understanding this?

An object is moving in a straight line at 50 miles per hour and has no forces acting on it. According to Newton’s first law of motion, what is the shape of this object’s orbit?

If an object is going in a circle at a constant speed of 3 feet per second, is it accelerating?

If you have two masses one meter apart, and then you move them so that they are three meters apart, how does the gravitational force between them change?

How would your weight change if the radius of the Earth remained the same but its mass were doubled?

What was Newton's great scientific success with his laws of motion & gravitation?

What was the larger cultural significance of Newton's work?

Give an example of other natural laws that people discovered following the example of Newton's discovery of natural laws in physics?

Give some examples of the ways we live with the legacy of the 17th C Scientific Revolution today.