

<b>Problem 1</b>	5 %	<p>D.</p> <p>20 cm = 0.2 m.  <math>30^\circ = 1/12</math> of a whole <math>360^\circ</math> in a circumference.</p> <p><math>0.2 \times 12 = 2.4</math> m</p>
<b>Problem 2</b>	5 %	<p>D.</p> <p>We adapted it to <math>3/4</math> of the diameter of the Earth.</p>
<b>Problem 3</b>	5 %	<p>E.</p> <p>All of them are correct.</p>
<b>Problem 4</b>	5 %	<p>D.</p> <p>Waning gibbous.</p>
<b>Problem 5</b>	5 %	<p>C.</p> <p>Waxing gibbous.</p>
<b>Problem 6</b>	5 %	<p>A.</p>
<b>Problem 7</b>	5 %	<p>A.</p> <p>New Moon because the Sun has to be directly behind the Moon for a lunar eclipse to happen.</p>

<b>Problem 8</b>	5 %	C.  Penumbra
<b>Problem 9</b>	5 %	A.  It moves eastward (to the right in the sky) and it's prograde motion.
<b>Problem 10</b>	5 %	B.  Going "backwards" is retrograde. It's not due to epicycles, since that theory was completely replaced by Galileo and Copernicus.
<b>Problem 11</b>	5 %	C.  It has a diameter of about 14 cm
<b>Problem 12</b>	5 %	A.  We showed that in class. Its diameter is 1.3 mm!
<b>Problem 13</b>	5 %	B.  It's actually 6 meters away (refer to Solar System Sizes worksheet), which is about 6 strides.

<b>Problem 14</b>	5 %	<p>D.</p> <p>Tractor tire. They actually used a really big beach ball, which is of about the same size.</p>
<b>Problem 15</b>	5 %	<p>A.</p> <p>Empty space, we talked about it in class.</p>
<b>Problem 16</b>	5 %	<p>C.</p> <p>Semi-circle is the only one in the list which is not a conic section.</p>
<b>Problem 17</b>	5 %	<p>D.</p> <p>When the two foci are at the same spot, all the points are at the same distance from that point, which creates a circle.</p>
<b>Problem 18</b>	5 %	<p>C.</p> <p>Eccentricity (<math>e</math>) = <math>c/a</math>. <math>c</math> is the distance between the foci, which changes from one ellipse to another. <math>a</math> is the semimajor axis,</p>

which is constant in all these ellipses.

For the case of the circle,  $c = 0$  because the two foci are at the same spot. Thus, it is the smallest eccentricity possible: 0.

**Problem 19**

5 %

D.

Since the pie crust is bigger on the right wedge than on the left one, and it's taken the same time to do both pie crusts, the speed is greater on the right.

**Problem 20**

5 %

3.63 years.

$$P = \text{Sqrt}(2.36^3) = 3.6255$$