Answers to Wkst E: Review

AP PreCalc Unit 3

1a) No triangles

1b) Two triangles

1c) One triangle

1d) One triangle

1e) No triangle

2a) R = 40°
q = $\frac{7 \sin 97}{\sin 43} \approx 10.19$
r = $\frac{7 \sin 40}{\sin 43} \approx 6.60$

2b) ΔMNP Solution 1:
$N_1 = \sin^{-1}\left(\frac{13}{11}\sin 41\right) \approx 50.84°$
$P_1 = 139 - \sin^{-1}\left(\frac{13}{11}\sin 41\right) \approx 88.16°$
$p_1 = \frac{11 \sin P_1}{\sin 41} \approx 16.76$

ΔMNP Solution 2:
$N_2 = 180 - \sin^{-1}\left(\frac{13}{11}\sin 41\right) \approx 129.16°$
$P_2 = \sin^{-1}\left(\frac{13}{11}\sin 41\right) - 41 \approx 9.84°$
$p_2 = \frac{11 \sin P_2}{\sin 41} \approx 2.86$

2c) $t = \sqrt{109 - 60\cos 55} \approx 8.64$
After finding the third side, you can either use law of sines or cosines to finish the triangle. If you use law of sines, you MUST find the largest angle first. Based on which law you choose to use to solve, your exact answer may vary, however you should have the same approximate value. The exact answers below were found using the law of cosines.
$Y = \cos^{-1}\left(\frac{10-3\cos 55}{\sqrt{109-60\cos 55}}\right) \approx 16.54°$
$P = 125° - \cos^{-1}\left(\frac{10-3\cos 55}{\sqrt{109-60\cos 55}}\right) \approx 108.46°$

2d) $E = \cos^{-1}\left(-\frac{1}{7}\right) \approx 98.21°$
R = 60°
$D = 120 - \cos^{-1}\left(-\frac{1}{7}\right) \approx 21.79°$

3) Area ≈ 16.00 units^2

4) Area ≈ 12.05 units^2

5) Area ≈ 70.66 units^2

6) Area ≈ 40.77 units^2

7) The boat is approximately 80.82 miles from the shore.

8) diagonal 1 = $\sqrt{34 - 30\cos 50}$
diagonal 2 = $\sqrt{34 - 30\cos 130}$
The lengths of the diagonals are approximately 3.84 units and 7.30 units.

9) $e = \sqrt{3400 - 3000\cos 100}$
$\theta = 180° - (F - 10°) \approx 161.85°$
The fisherman must travel approximately 62.62 miles from Forrest Island at a compass heading of 161.85° to get back to Home Port

10) When the angle of elevation from Earth to the sun is 39.4° the greatest distance from Earth to Venus is approximately 1.12 AU and the shortest distance is approximately 0.43 AU.

11) The height of the building is approximately 75.10 feet.

12) At 2 pm (6hrs later), the ships are approximately 237.69 nautical miles apart.

13) $x > 4$

14.1) sometimes
14.2) sometimes
14.3) always
14.4) always
14.5) always
14.6) never