

1.

- | | |
|--|---------------------|
| a. the degree measure of $\angle F$ | 63.96° |
| b. the length of side EF | 12.53 units |
| c. the length of the median from vertex D | 10.83 units |
| d. the length of the altitude from vertex D | 10.78 units |
| e. the area of the circumscribed circle of $\triangle DEF$ | 164.41 square units |

2. One triangle: $c \approx 15.10$, $\angle B \approx 48.52^\circ$, $\angle C \approx 109.48^\circ$.

Another triangle: $c \approx 7.15$, $\angle B \approx 131.48^\circ$, $\angle C \approx 26.52^\circ$.

If your pictures of the triangles were extremely unrealistic (e.g., obtuse measures drawn as acute angles), I gave a “4” instead of a “5.”

3. Begin by drawing segment PR. Write a pair of Law of Cosines equations for $\triangle PQR$ (involving $\cos \angle Q$) and $\triangle PSR$ (involving $\cos \angle S$). Now you have two expressions for PR^2 , which you can set equal. Then, since $\angle Q$ and $\angle S$ are supplementary, you can replace $(\cos \angle S)$ with $(-\cos \angle Q)$. Solve for $\cos \angle Q$, then get $\angle Q$.
- 122.57°
 - 4.41 units
 - 10.95 square units