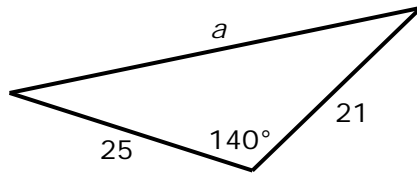


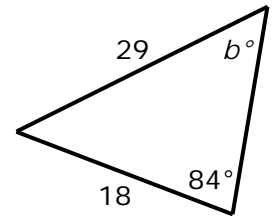
Level 2 Trigonometry Achieved #3

Calculate the unknown for each triangle

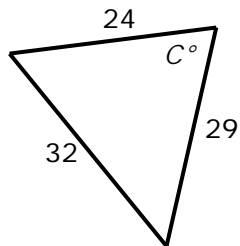
1. $a =$



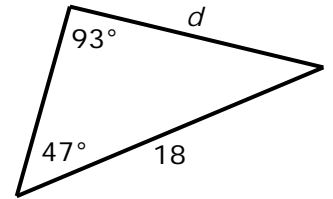
2. $b^\circ =$



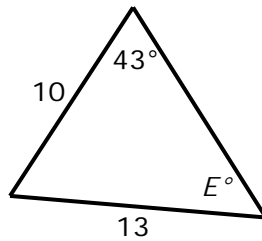
3. $C^\circ =$



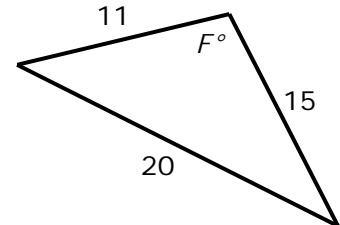
4. $d =$



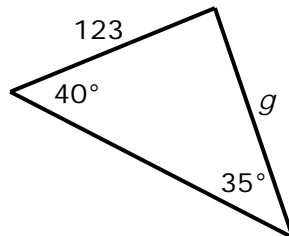
5. $E =$



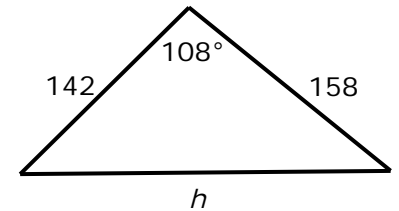
6. $F^\circ =$



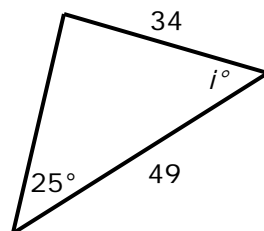
7. $g =$



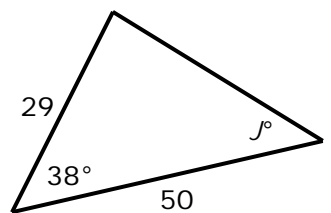
8. $h =$



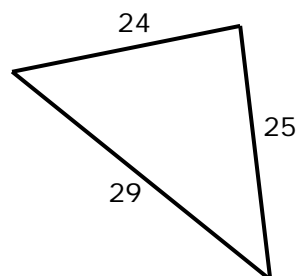
9. $i^\circ =$



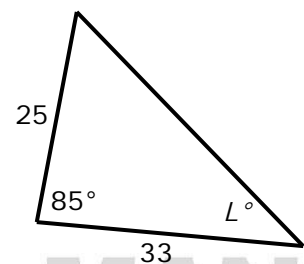
10. $J^\circ =$



11. Area =



12. $L^\circ =$



Answers: Level 2 Trigonometry Achieved #3

1. $a^2 = 25^2 + 21^2 - 2 \times 25 \times 21 \times \cos 140^\circ = 1870.3$ $a = \sqrt{1870.3} = 43.25$

2. $\sin b^\circ = \frac{\sin 84^\circ}{29} \times 18 = 0.61729$ $b^\circ = \sin^{-1}(0.61729) = 38.12^\circ$

3. $\cos C^\circ = \frac{29^2 + 24^2 - 32^2}{2 \times 29 \times 24} = \frac{393}{1392}$ $C^\circ = \cos^{-1}\left(\frac{393}{1392}\right) = 73.60^\circ$

4. $d = \frac{18}{\sin 93^\circ} \times \sin 47^\circ = 13.18$

5. $\sin E^\circ = \frac{\sin 43^\circ}{13} \times 10 = 0.5246$ $E^\circ = \sin^{-1}(0.5246) = 31.64^\circ$

6. $\cos F^\circ = \frac{11^2 + 15^2 - 20^2}{2 \times 11 \times 15} = \frac{-54}{330}$ $F^\circ = \cos^{-1}\left(\frac{-54}{330}\right) = 99.42^\circ$

7. $g = \frac{123}{\sin 35^\circ} \times \sin 40^\circ = 137.84$

8. $h^2 = 142^2 + 158^2 - 2 \times 142 \times 158 \times \cos 108^\circ = 58994.21$ $h = \sqrt{58994} = 242.89$

9. Call angle opposite side of length 49 = y° :

$$\sin y^\circ = \frac{\sin 25^\circ}{34} \times 49 = 0.609067 \quad y^\circ = \sin^{-1}(0.609067) = 37.52^\circ$$

$$i^\circ = 180 - 37.52 - 25 = 117.48^\circ$$

10. We find missing side, call it x , and use that to find the angle:

$$x^2 = 29^2 + 50^2 - 2 \times 29 \times 50 \times \cos 38^\circ = 1055.77 \quad x = \sqrt{1055.77} = 32.49$$

$$\cos J^\circ = \frac{50^2 + 32.49^2 - 29^2}{2 \times 50 \times 32.49} = \frac{2714.77}{3249} \quad J^\circ = \cos^{-1}\left(\frac{2714.6}{3249}\right) = 33.32^\circ$$

11. Need an angle, doesn't matter which. Make it the top one.

$$\cos k^\circ = \frac{24^2 + 25^2 - 29^2}{2 \times 24 \times 25} = \frac{360}{1200} \quad k^\circ = \cos^{-1}\left(\frac{360}{1200}\right) = 72.54^\circ$$

$$\text{Area} = \frac{1}{2} \times 24 \times 25 \times \sin 72.54^\circ = 286.18$$

12. Find the side opposite 85°

$$o^2 = 25^2 + 33^2 - 2 \times 25 \times 33 \times \cos 85^\circ = 1570.19 \quad o = \sqrt{1570.2} = 39.63$$

$$\cos L^\circ = \frac{33^2 + 39.63^2 - 25^2}{2 \times 33 \times 39.63} = \frac{2034.2}{2615.6} \quad L^\circ = \cos^{-1}\left(\frac{2034.2}{2615.6}\right) = 38.94^\circ$$