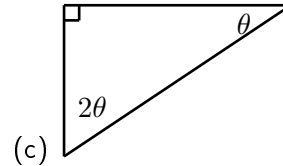
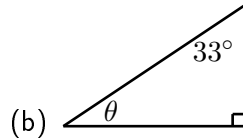
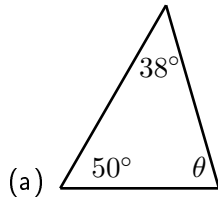


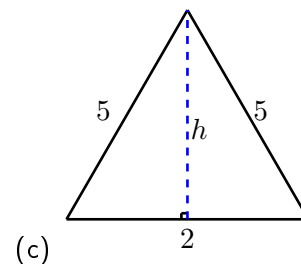
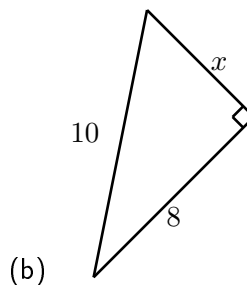
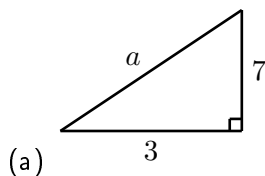
Introduction to Trigonometry

Problem Set 14

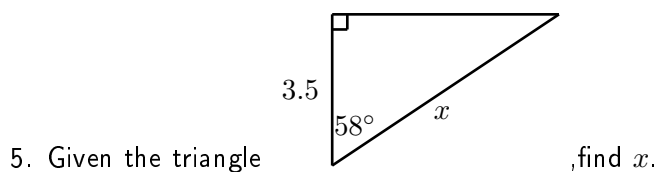
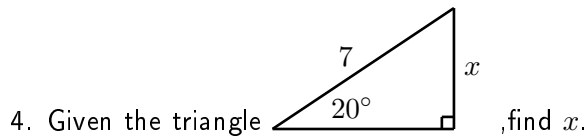
1. For each of the following triangles, find the angle θ given in degrees.



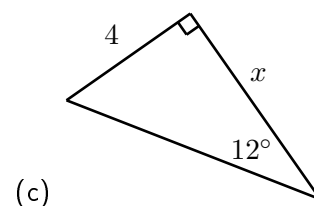
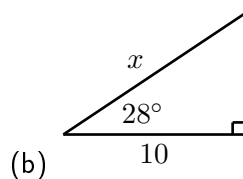
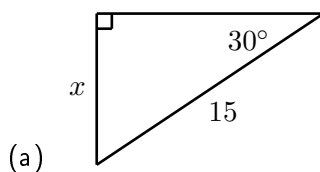
2. Using Pythagoras Theorem to find the missing sides of the following triangles.



3. If $\sin \alpha = \frac{5}{13}$, sketch a right-angled triangle to represent this, and find $\cos \alpha$ and $\tan \alpha$.



6. Find the side x in each of the following triangles.



7. The elongation α of a planet is the angle formed by the planet, earth and sun. When Venus achieves its maximum elongation of 46.3° , the earth, Venus and the sun form a triangle with a right angle at Venus. Find the distance between Venus and the Earth in astronomical units. (By definition the distance between the earth and the sun is 1 AU).

8. Given $\tan \theta = \frac{5}{6}$, sketch a right-angled triangle to represent this and find the other five trig ratios.

9. Convert the following angles in degrees to radians.

- | | | |
|-----------------|----------------|-----------------|
| (a) 55° | (c) 23° | (e) 240° |
| (b) 120° | (d) 27° | (f) 135° |

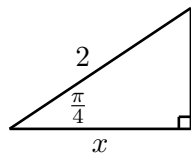
10. Convert the following angles in radians to degrees.

- | | | | |
|---------------------|----------------------|---------------------|----------------------|
| (a) $\frac{\pi}{3}$ | (b) $\frac{5\pi}{6}$ | (c) $\frac{\pi}{7}$ | (d) $\frac{2\pi}{3}$ |
|---------------------|----------------------|---------------------|----------------------|

11. Sketch the following angles on the plane and note which quadrant they lie in.

- | | | |
|----------------------|-----------------------|-----------------------|
| (a) $\frac{\pi}{3}$ | (d) $\frac{5\pi}{6}$ | (g) $-\frac{\pi}{3}$ |
| (b) $\frac{2\pi}{3}$ | (e) $\frac{10\pi}{9}$ | (h) $-\frac{5\pi}{6}$ |
| (c) $\frac{4\pi}{3}$ | (f) $\frac{7\pi}{4}$ | (i) 3π |
| | | (j) $\frac{13\pi}{3}$ |

12. Find the exact value of $\tan \frac{5\pi}{15}$.



13. Given the triangle, find x .

14. Find the exact values of the following trig ratios.

- | | | |
|---------------------------------------|--|--|
| (a) $\sin\left(\frac{4\pi}{3}\right)$ | (d) $\sin\left(\frac{11\pi}{6}\right)$ | (g) $\cos\left(\frac{7\pi}{3}\right)$ |
| (b) $\cos\left(\frac{3\pi}{4}\right)$ | (e) $\tan\left(-\frac{\pi}{3}\right)$ | (h) $\sin\left(\frac{35\pi}{6}\right)$ |
| (c) $\tan\left(\frac{7\pi}{6}\right)$ | (f) $\tan\left(-\frac{5\pi}{6}\right)$ | (i) $\sec\left(\frac{2\pi}{3}\right)$ |

Ans: 1a) 92° , b) 57° , c) 30° , 2a) $\sqrt{58}$, b) 6, c) $\sqrt{24}$, 6a) 7.5, b) 11.33, c) 18.82,