

## Plane Trigonometry Final Exam Review

1. The angles  $(6x + 4)^\circ$  and  $(3x - 4)^\circ$  are complementary. Find the measure of the angles.
2. Find an angle between  $0^\circ$  and  $360^\circ$  that is coterminal to  $853^\circ$ .
3. Triangle  $ABC$  is similar to triangle  $DEF$ ,  $AB = 10$ ,  $BC = 15$ , and  $AC = 20$ . If  $DE = 25$ , find  $DF$  and  $EF$ .
4. Find all six trigonometric functions of the angle  $150^\circ$  using exact values without a calculator.
5. If  $\theta$  is in quadrant IV, and  $\cos(\theta) = \frac{5}{9}$ , find the other five trigonometric functions of  $\theta$ .
6. Joe is standing 100 ft from the base of a skyscraper, and while looking at the top of the skyscraper, his line of sight has an angle of elevation of  $72^\circ$ . How tall is the skyscraper? (You can ignore Joe's height in this problem).
7. Find all circular functions of  $-\frac{\pi}{4}$  using exact values without a calculator.
8. Cities  $A$  and  $B$  have latitudes of  $20^\circ$  N and  $25^\circ$  N, respectively. If city  $B$  is directly North of city  $A$ , what is the distance between them? (Hint: the radius of Earth is approximately 6400 km.)
9. A satellite is 2000 km above the Earth's surface and makes one circular orbit every 3 hours. What is its linear speed?
10. Simplify  $\frac{\sin^2(\theta)}{1 - \sin^2(\theta)}$ .
11. Solve the equation  $2 \cos(\theta) + \sqrt{3} = 0$ , for all values of  $\theta$  in  $[0, 2\pi)$ .
12. Solve triangle  $ABC$  if  $A = 20^\circ$ ,  $B = 60^\circ$ , and  $a = 7$  cm.
13. Solve triangle  $ABC$  if  $a = 50$ ,  $b = 70$ , and  $c = 90$ .