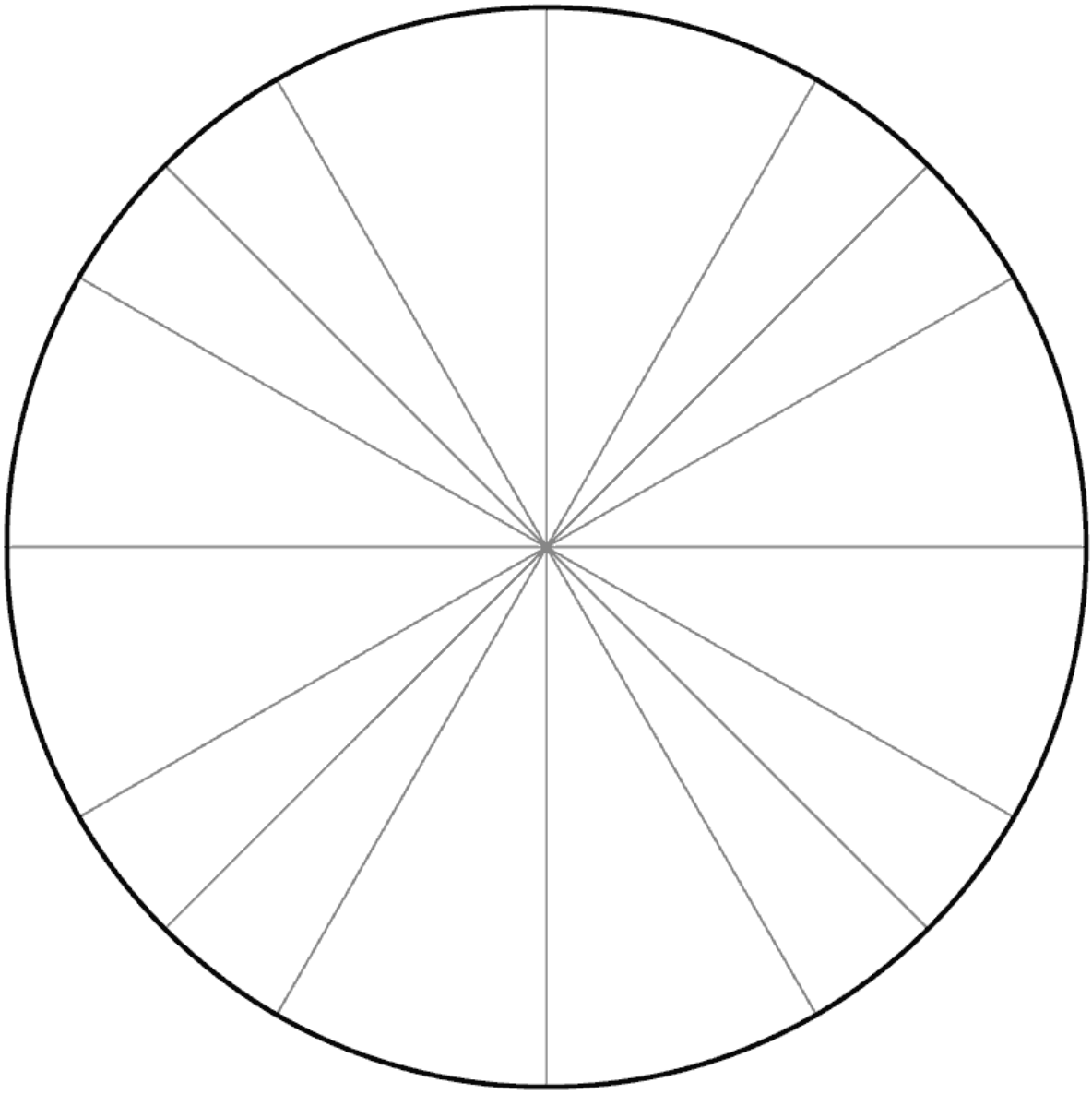
Calculus 1 Prep Problems

1. Label the unit circle with all coordinates, slopes, and angles (degrees and radians):



Convert the following angles to either degrees or radians:

2. $270°$

3. $15°$

4. $324°$

5. $\frac{2\pi}{3}$

6. 14π

7. $\frac{25\pi}{2}$

8. Using the information given below, solve for the exact value of each of the remaining functions:

$$cos(\theta) = -\frac{5}{13} \ and \ sin(\theta) < 0$$

   a. $sin(\theta) =$

   b. $tan(\theta) =$

   c. $csc(\theta) =$

   d. $sec(\theta) =$

   e. $cot(\theta) =$

   f. What quadrant is the triangle located in?

9. Graph the following functions in the space provided. Label at least 5 points and all relevant asymptotes.
    a. $f(x) = 2sin\left(x + \frac{\pi}{2}\right)$

    b. $f(x) = cos(\pi x) - 2$

c. $f(x) = tan\left(\frac{1}{\pi}x\right)$

d. $f(x) = 2arcsinx - \pi$

e. $f(x) = \frac{1}{3} arccos(x + 1)$

f. $f(x) = arctan(\pi x)$

Solve the following systems of equations:

10. $y = x^2 - 4x$
    $y = -2x + 4x + 16$

11. $6x + 4y - 2 = 2x^3 + 6x^2 + 2y$
    $y = 6 - 2x^2 - 2x$

12. $y = x(x^2 + 6x + 20)$
    $y = -6x^2 - 24x - 48$

Solve the following expressions, simplifying as far as possible:

13. $\frac{14}{3} - \frac{9}{21}$

14. $\frac{1}{2} \div \frac{4}{3}$

15. $\frac{9a^7b^3c^{10}d^7}{12a^4bc^12d}$

16. $\frac{12x^2yz^3}{x^3y^2z} + \frac{x^2yz^3}{xyz}$

17. $\frac{q^2rs^3}{4pq} \div \frac{qr^3s}{2pq}$

For the following functions, simplify the expression

$$\frac{f(x+h)-f(x)}{h}$$

as far as possible (without an *h* in the denominator):

18. $f(x) = 3x + 5$

19. $f(x) = 12 - x$

20. $f(x) = x^2 + 6x + 9$