Homework Set 1
(review & appendix F)

Convert each decimal or fraction to its corresponding reduced fraction:

1. \( \frac{255}{345} \)

2. \( 0.54 \)

3. \( 1.0\overline{67} \)

Complete the Square on the following expressions:

4. \( x^2 + 4x - 10 \)

5. \( 3x^2 - 4x \)

6. Evaluate the expression and give your answer in simplest form:

\[
\frac{1}{\left(2 + \frac{x}{3-x} \right)}
\]
Use trig properties to solve.

7. Find $\theta$ such that $\tan \theta = 1$, $0 \leq \theta \leq 2\pi$

8. Match the radian representation of the angle to its corresponding degree representation.

   a. $\frac{\pi}{2}$ 135°
   
   b. $\frac{\pi}{6}$ 30°
   
   c. $\frac{3\pi}{4}$ 60°
   
   d. $\frac{\pi}{3}$ 90°

Find the derivatives of the following functions:

9. $f(x) = x^5 + 15x^4 - 4x + 3$

10. $f(x) = (3x^2 - 6x + 1)^7$

11. $f(x) = \sin 5x$

12. $f(x) = \frac{2}{x^5}$
13. \( f(x) = \left(\frac{x-2}{3x+1}\right)^3 \)

Write each sum in expanded form.

\[
\sum_{k=1}^{5} \sqrt{k} =
\]

\[
\sum_{k=2}^{6} x^k =
\]

Write each sum in sigma notation.

\[
1 + 3 + 5 + 7 + \cdots + (2n - 1) =
\]

\[
1 + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} + \frac{1}{25} + \frac{1}{36} =
\]

Find the value of each sum.

\[
\sum_{i=1}^{100} 3
\]

\[
\sum_{k=1}^{n} (2 - 5k)
\]

\[
\sum_{k=1}^{n} k(k + 2)
\]