

Please be sure to show ALL work. If you do not show your work, you will not receive credit.  
Enjoy your break!

- 1) Divide the following using synthetic division:

$$(x^3 + 5x^2 + 7x + 3) \div (x + 3)$$

- 2) Divide the following using synthetic division:

$$(3x^3 - 5x^2 + 2) \div (x - 2)$$

- 3) When the polynomial  $p(x) = (x^3 - 5x^2 + bx - 3)$  is divided by the expression  $(x - 3)$  the quotient is  $(x^2 - 2x + 1)$ , what is the value of  $b$ ?

- 4) The area of a rectangle is represented by the expression  $(2x^3 + 13x^2 + 10x - 25)$ . If the length of the rectangle is represented by  $(x + 5)$ , what is the width?

- 5) The volume of a rectangular prism is represented by the expression  $(x^3 + 8x^2 + 21x + 18)$ . The width of the rectangular prism is represented by the expression  $(x + 2)$ . If the height and the length are the same, what is the height of the rectangular prism?

- 6) In the following problem is  $(x-1)$  a factor of the polynomial explain why or why not using the remainder theorem?  $(x^3 + x^2 + x + 1) \div (x - 1)$

- 7) Identify the remainder of the following problem:  $(2x^3 - 5x - 6) \div (x - 2)$

Rational Practice:

1) Simplify:  $\frac{x+6}{x^2-36}$

2) Divide:  $\frac{x+7}{x^2+5x+6} \div \frac{x^2+7x}{x+3}$

3) Divide:  $\frac{3}{x^2-9} \div \frac{2}{x+3}$

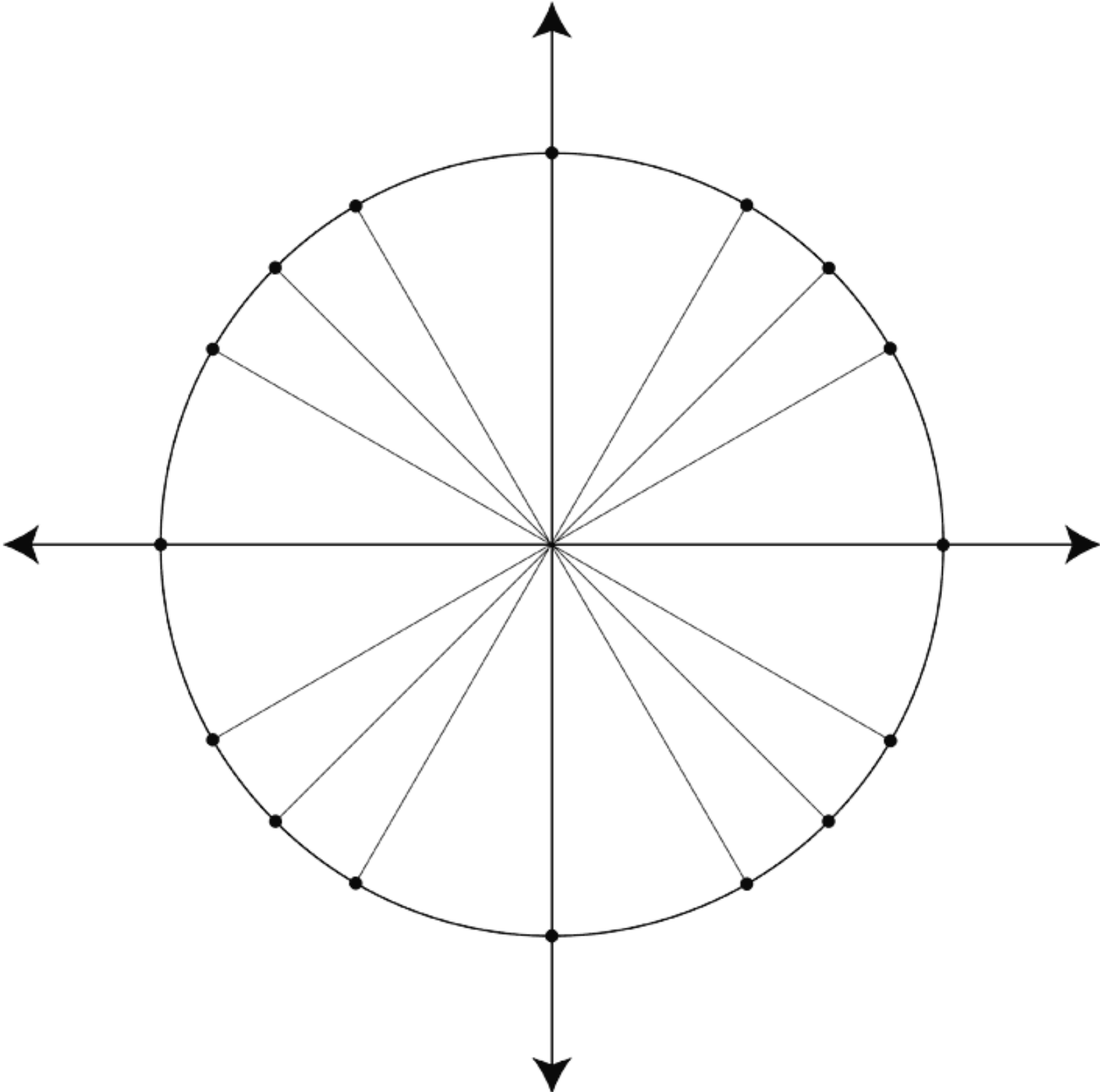
4) Multiply:  $\frac{2x+6}{x^2+10x+25} \cdot \frac{x^2-25}{x^2+8x+15}$

5) Add:  $\frac{2}{x-5} + \frac{4}{x+5}$

6) Add:  $\frac{5x}{x^2-16} + \frac{3}{x-4}$

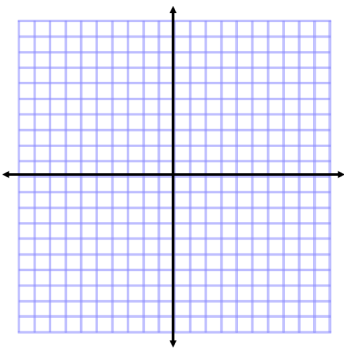
7) Subtract:  $\frac{6}{x^2+7x+10} + \frac{4}{x+2}$

Complete the Following Unit Circle:



Find the domain and range of the following:

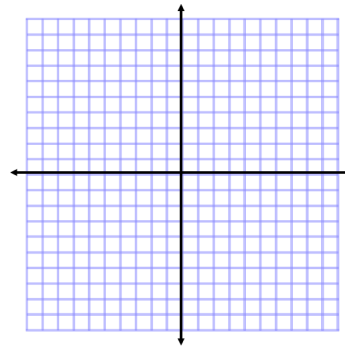
1.  $f(x) = \sqrt{x+6}$



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

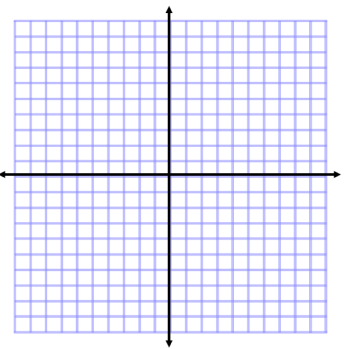
2.  $f(x) = (x-3)^2 - 1$



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

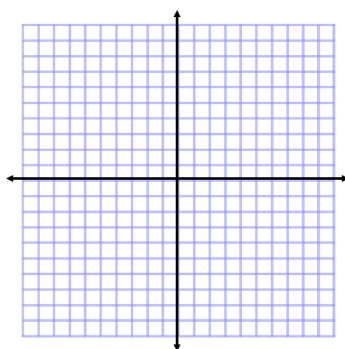
3.  $f(x) = -4x^2 - 5$



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

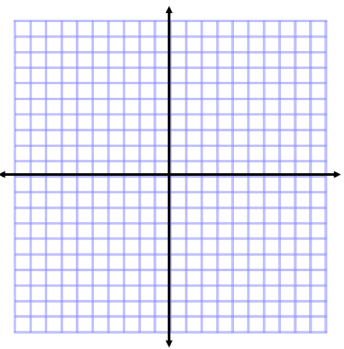
4.  $f(x) = (x-5)^3$



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

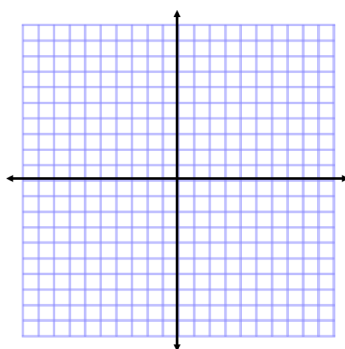
5.  $f(x) = |x+3| + 6$



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

6.  $f(x) = -\sqrt{x+7}$



Domain: \_\_\_\_\_

Range: \_\_\_\_\_