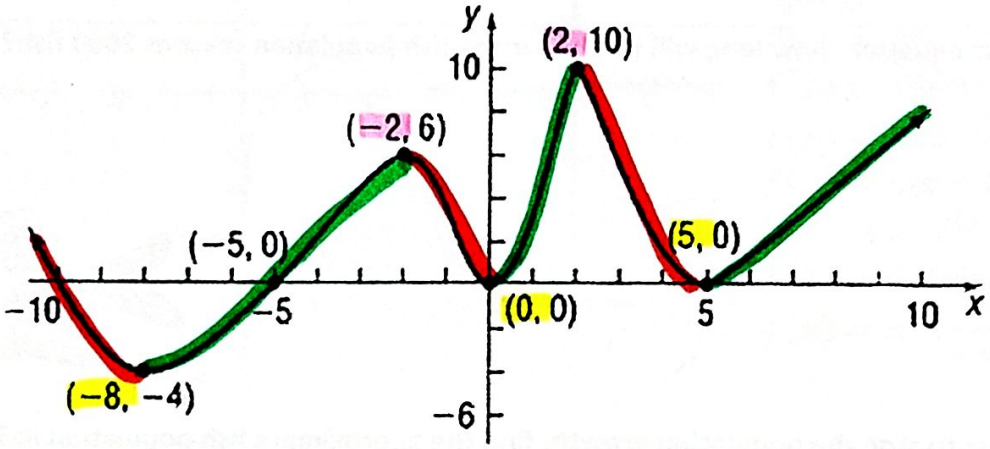
Trigonometry/Precalculus
Chapter 3 Extra Practice
Day _____

Name
Date
Block

1) Use four different colors to highlight each of the following:

• intervals of increase • intervals of decrease	• x-coordinate of each Relative minimum • x-coordinate of each Relative maximum



2) Determine whether each of the following represents an **interval** (x-values only) of increase or decrease.

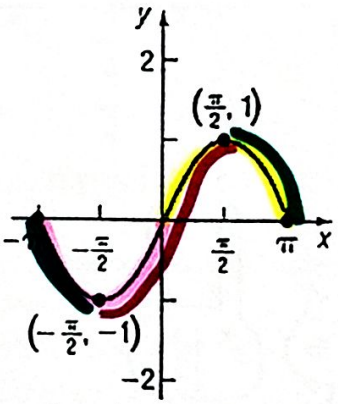
a) (2, 5) decrease

b) (5, ∞) increase

c) (-8, -2) increase

d) (-2, 0) decrease

3) Determine the intervals of concavity for this section of the sine function.



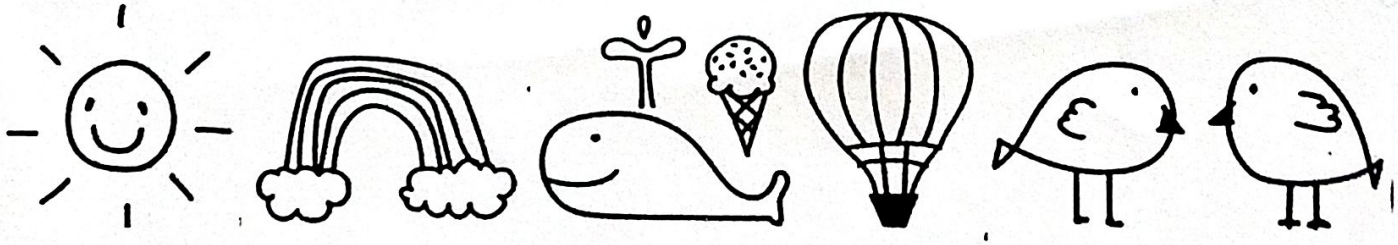
Concave Up: $(-\pi, 0)$

Concave Down: $(0, \pi)$

4) List the intervals of increase and decrease for the same section of the sine function above.

Interval(s) of Increase: $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

Interval(s) of Decrease: $\left(-\pi, -\frac{\pi}{2}\right) \cup \left(\frac{\pi}{2}, \pi\right)$



5) During a study of an invasive study of fish, scientists approximate that the population in a lake is 300 fish in year one of the study. In year 4 of the study, the population climbed to 1200 fish.

a) Use the equation $y = ab^x$ to model the fish population.

$(1, 300) \rightarrow 300 = a \cdot b^1$

$(4, 1200) \quad 1200 = a \cdot b^4$

$\frac{1200}{300} = \frac{a \cdot b^4}{a \cdot b^1}$ $\quad 4 = b^3$

$b = 1.59$

$300 = a(1.59)$

$a = 188.7 \approx 189$

b) What does the value of "a" represent in the equation you wrote?

$y = 189(1.59)^x$

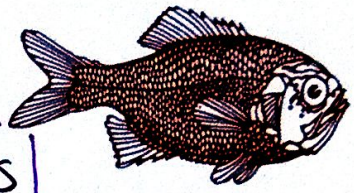
↑ # of fish when study started

c) According to your equation, how long will it take for the fish population reaches 2000 fish?

$\frac{2000}{189} = \frac{189(1.59)^x}{189}$ $\quad y$

$\log_{1.59} 10.58 = \log_{1.59} 1.59^x$

$x = \log_{1.59} 10.58 \Rightarrow x = 5.1$ years



d) If nothing is done to stop the population growth, find the approximate fish population in 7 years.

$x = 7$

$y = 189(1.59)^7$

$y = 4855.6$

$y = 4856$ fish