

# Classroom Voting Questions: Calculus I

## 4.3 Families of Curves

1. The functions in Figure 4.4 have the form  $y = A \sin x$ . Which of the functions has the largest  $A$ ? Assume the scale on the vertical axes is the same for each graph.

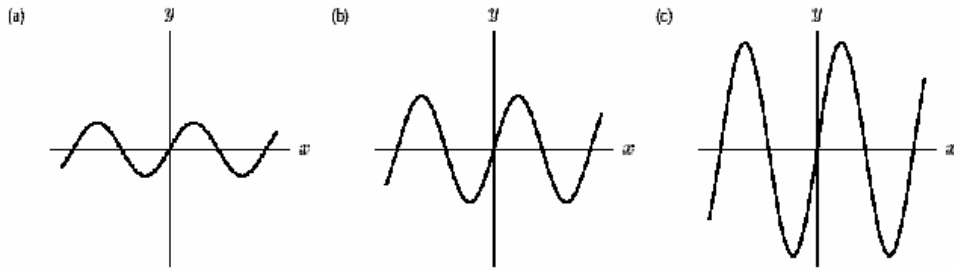


Figure 4.4

2. The functions in Figure 4.5 have the form  $y = \sin(Bx)$ . Which of the functions has the largest  $B$ ? Assume the scale on the horizontal axes is the same for each graph.

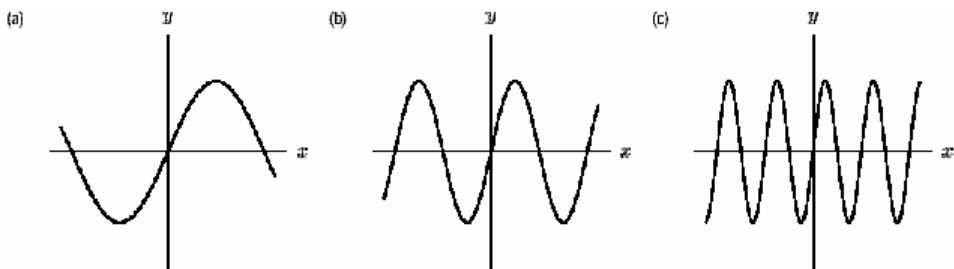


Figure 4.5

3. Let  $f(x) = ax + b/x$ . What are the critical points of  $f(x)$ ?
- (a)  $-b/a$
  - (b) 0
  - (c)  $\pm\sqrt{b/a}$
  - (d)  $\pm\sqrt{-b/a}$
  - (e) No critical points
4. Let  $f(x) = ax + b/x$ . Suppose  $a$  and  $b$  are positive. What happens to  $f(x)$  as  $b$  increases?
- (a) The critical *points* move further apart.

- (b) The critical *points* move closer together.
5. Let  $f(x) = ax + b/x$ . Suppose  $a$  and  $b$  are positive. What happens to  $f(x)$  as  $b$  increases?
- (a) The critical *values* move further apart.  
(b) The critical *values* move closer together.
6. Let  $f(x) = ax + b/x$ . Suppose  $a$  and  $b$  are positive. What happens to  $f(x)$  as  $a$  increases?
- (a) The critical *points* move further apart.  
(b) The critical *points* move closer together.
7. Let  $f(x) = ax + b/x$ . Suppose  $a$  and  $b$  are positive. What happens to  $f(x)$  as  $a$  increases?
- (a) The critical *values* move further apart.  
(b) The critical *values* move closer together.
8. Find a formula for a parabola with its vertex at (3,2) and with a second derivative of -4.
- (a)  $y = -4x^2 + 48x - 106$ .  
(b)  $y = -4x^2 + 24x - 34$ .  
(c)  $y = -2x^2 + 12x - 16$ .  
(d)  $y = -2x^2 + 4x + 8$ .