

# 153 Diagnostic Exam

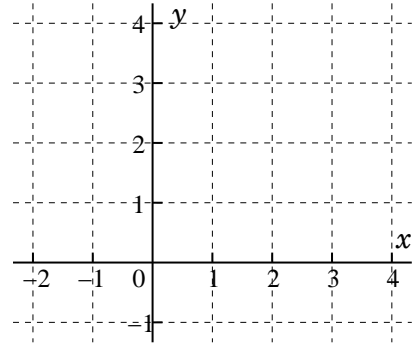
The results of these questions will help the instructors to prepare the course more suitably. The answers will **NOT** influence your course grade. Please answer these questions as accurately as possible.

Name \_\_\_\_\_

1. Write  $\left(3x^2 - \frac{4}{x}\right)(2x^3 + 4x)$  as a polynomial in standard form (“expanded”).

The polynomial is \_\_\_\_\_

2. Find an equation for the line through the points  $(-1, 0)$  and  $(3, 2)$ . **Sketch the line** on the axes to the right.



An equation for the line is \_\_\_\_\_

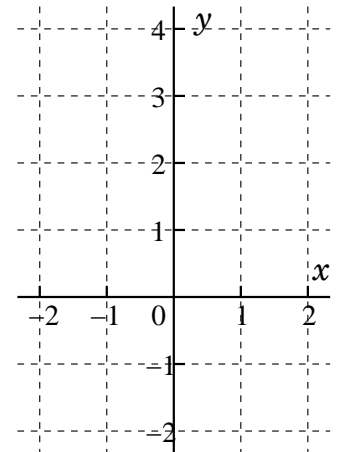
3. Suppose  $f(x) = x^2 + 3$ .

a) Then  $f(2) = \underline{\hspace{2cm}}$  and  $f\left(-\frac{1}{3}\right) = \underline{\hspace{2cm}}$ .

b) Find a formula for  $f(f(x))$  (with *no mention of f!*) which is correct for any value of  $x$ .

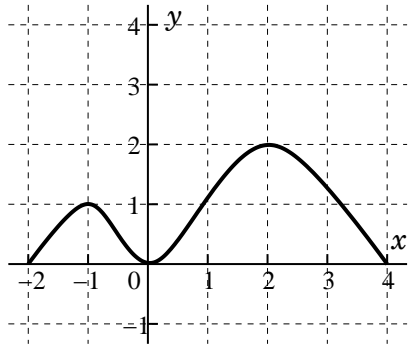
A formula for  $f(f(x))$  is \_\_\_\_\_

4. If  $g(x) = -x^2 + 3$ , **sketch a graph** of  $y = g(x)$  on the axes to the right.

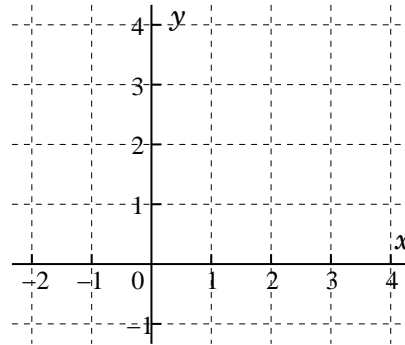


**OVER**

5. Below to the left is a graph of  $y = h(x)$ . **Sketch a graph** of  $y = 2h(x)$  on the other axes below.



Graph of  $y = h(x)$

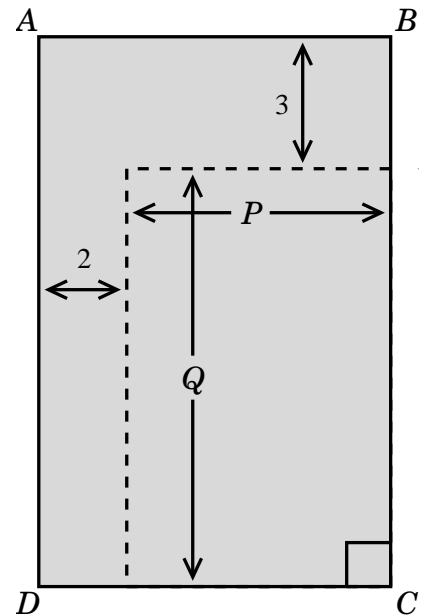


Graph of  $y = 2h(x)$

6. Inside the rectangle  $ABCD$  and sharing a right angle with it is another rectangle as shown to the right.  $P$  and  $Q$  are the lengths of two consecutive sides of the inner rectangle.

**Write an expression for the area of rectangle  $ABCD$  involving  $P$  and  $Q$  and other needed numbers and operations.** Use any of the information displayed.

You do *not* need to “simplify” your expression!



The area of rectangle  $ABCD$  is \_\_\_\_\_