# Math 100 – College Algebra Exam I

Monday June 19, 2006

Name: Instructor:

SHOW ALL NECESSARY WORK AND SIMPLIFY ALL ANSWERS COMPLETELY!

**1.** (4 pts) Express in interval notation: $\{x \mid -7 \le x < 15\}$

**2.** (6 pts) Simplify: $\left(\dfrac{24a^{7}b^{-9}c^{12}}{4a^{5}b^{-2}c^{13}}\right)^{3}$

**3.** (5 pts) Multiply: $(7x+5y+2)(7x+5y-2)$

**4.** (5 pts) Factor by grouping: $6x^{3}+12x^{2}+7x+14$

**5.** (5 pts) Add: $\dfrac{5}{x+8}+\dfrac{9}{x^2-64}$

**6.** (5 pts) Simplify: $\sqrt[3]{\dfrac{81a^{12}}{32b^{21}}}$

**7.** (15 pts) The two points $(-1,-2)$ and $(5,6)$ are endpoints of a diameter of a circle.

(a) Find the center of the circle, i.e. the midpoint.

(b) Find the radius of the circle using the point $(5,6)$.

(c) Write down the equation of the circle using the information found in parts (a) and (b).

**8.** (5 pts) Find the domain: $f(x)=\dfrac{x^2+3x+5}{4x^2+13x+3}$

**9.** (4 pts) Find the slope of the line between the points $(-2,-1)$ and $(4,1)$.

**10.** (12 pts) Write an equation of a line passing through the point $(2,-7)$ and

(a) parallel to the line $y=2x+1$.

(b) perpendicular to the line $y=2x+1$.

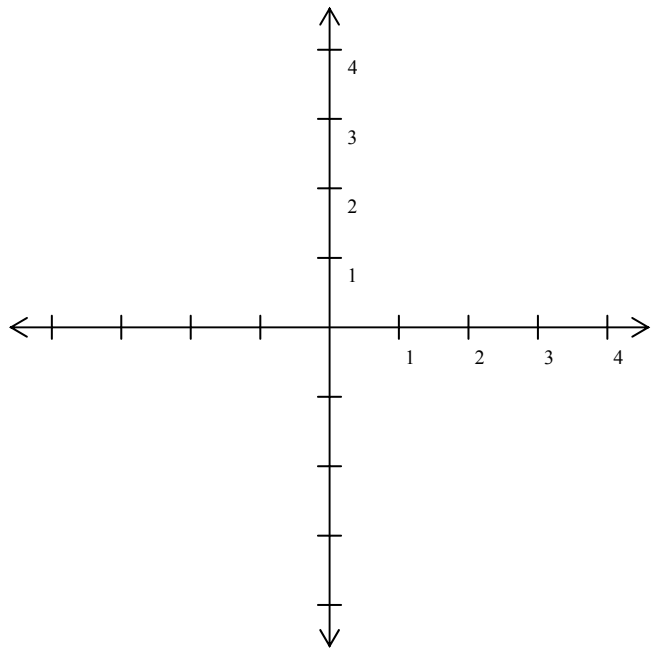
**11.** (10 pts) Given $f(x) = x^3 - 4$ and $g(x) = x + 2$, find:

(a) $(f - g)(3)$

(b) $(fg)(3)$

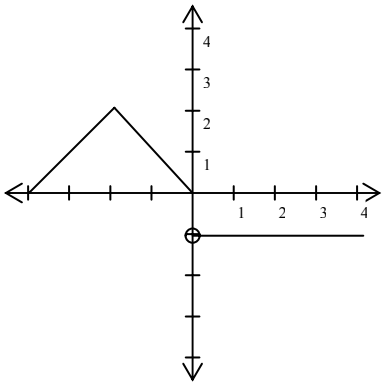
**12.** (6 pts) Is the following function even, odd, or neither? Why? $f(x) = \sqrt{x^2 + 1}$

**13.** (6 pts) Graph $f(x)=\begin{cases} x^2 & for\, x<0 \\ 2x-3 & for\, x\geq 0 \end{cases}$




**14.** (12 pts) The graph of $y=f(x)$ is shown in the first picture. Sketch the graphs requested on the other two. Underneath, describe in words the transformations of the graph of $y=f(x)$.

$y=f(x)$ $\qquad$ $y=-2f(x)$ $\qquad$ $y=f(x-1)$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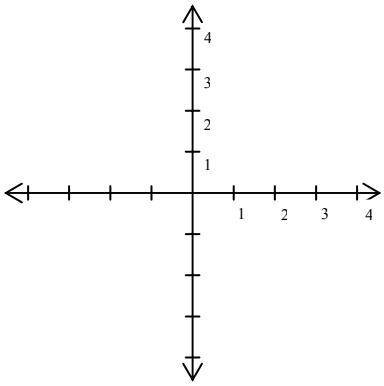
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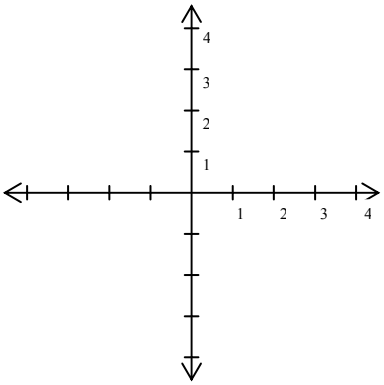
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