Math 41 Quiz 1
8:30am – 9:20am Version S
Mon Apr 16, 2012

NAME YOU ASKED TO BE CALLED IN CLASS: _____

SCORE: _____ / 20 POINTS

NO CALCULATORS ALLOWED
SHOW PROPER WORK & SIMPLIFY ALL ANSWERS
PUT A BOX AROUND EACH FINAL ANSWER

Solve the inequality $|x+14|+3>17$. **Write your final answer in interval notation.** **SCORE: _____ / 4 PTS**

$|x+14|>14$

$x+14>14$ or $x+14<-14$

$x>0$ or $x<-28$

$\boxed{(-\infty,-28)\cup(0,\infty)}$

Use absolute value notation to define the interval(s) of all real numbers no more than seven units from -6. **SCORE: _____ / 2 PTS**

$|x-(-6)|\le 7$ $\quad\quad$ $\boxed{|x+6|\le 7}$

An airline offers daily flights between Chicago and Denver. The total yearly cost C (in millions of dollars) of these flights is $C=\sqrt{\frac{x}{2}+1}$, where x is the number of passengers (in thousands). The total cost of the flights last year was 6 million dollars. How many passengers flew last year ? **Write your final answer in a sentence.** **SCORE: _____ / 4 PTS**

$6=\sqrt{\frac{x}{2}+1}$

$36=\frac{x}{2}+1$

$35=\frac{x}{2}$

$70=x$

$\boxed{70{,}000 \text{ passengers flew last year}}$

Test $xy = 4$ for symmetry with respect to both axes and the origin. **State all conclusions clearly.** **SCORE: _____ / 3 PTS**
(You may use the "shortcuts" discussed in lecture.)

$(-x)y = 4$	$x(-y) = 4$	$(-x)(-y) = 4$
$-xy = 4$	$-xy = 4$	$xy = 4$
$xy = -4$	$xy = -4$	
not symmetric over $y-$axis	not symmetric over $x-$axis	symmetric over origin

ALTERNATE METHOD: show the graph is symmetric over the origin, but not symmetric over one axis, then say it is also not symmetric over the other axis since it can't be symmetric in exactly 2 ways

Consider the graph of $y = 2x^2 - 3x - 1$. **SCORE: _____ / 3 PTS**

[a] Find the $x-$intercepts of the graph.

$$0 = 2x^2 - 3x - 1$$
$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(-1)}}{2(2)} = \frac{3 \pm \sqrt{17}}{4}$$

$\left(\frac{3 \pm \sqrt{17}}{4}, 0 \right)$

[b] Find the $y-$intercepts of the graph.

$$y = 2(0)^2 - 3(0) - 1 = -1$$

$(0, -1)$

Find all solutions of the equation $\frac{1}{x-2} = \frac{3}{x+2} - \frac{6x}{x^2-4}$. **Check all solutions which are integers.** **SCORE: _____ / 4 PTS**

$$(x+2)(x-2)\left(\frac{1}{x-2}\right) = \left(\frac{3}{x+2} - \frac{6x}{(x+2)(x-2)}\right)(x+2)(x-2)$$
$$x + 2 = 3(x-2) - 6x$$
$$x + 2 = 3x - 6 - 6x$$
$$x + 2 = -3x - 6$$
$$4x = -8$$
$x = -2$ which makes the denominator of the last two fractions in the equation equal 0
NO SOLUTION