MAT 099
Spring, 2010

TEST A

Name KEY

Test 1

Solve each equation. You don't need to check your work, *but you should*, before you hand in the test.

5 1. $-4(3n-2)+n=-11(n-1)$

$-12n+8+n=-11n+11$

$-11n+8=-11n+11$

$-8=\quad -8$

$-11n=-11n+3$

$+11n=+11n$

$0=3$!?

No Soln !

$\{\varnothing\}$

10 2. $5x+12=2(2x+7)$

$5x+12=4x+14$

$-12=\quad -12$

$5x=4x+2$

$-4x=-4x$

$x=2$

$x\in\{2\}$

5 3. $2(x-8)+x=3(x-6)+2$

$2x-16+x=3x-18+2$

$3x-16=3x-16$

$0=0$

All real #s

5 4. $\left(\frac{1}{8}+\frac{x}{3}=\frac{5}{12}\right)(24)$

$3+8x=10$

$8x=7$

$x=\frac{7}{8}$

SEE TEST SUPPLEMENT

5 5. $\left(\frac{x+1}{8}-\frac{2-x}{3}=\frac{5}{6}\right)(24)$

$3(x+1)-8(2-x)=20$

$3x+3-16+8x=20$

$11x-13=20$

$11x=33$

$x=3$

SEE TEST SUPPLEMENT

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For word problems, I expect to see you assign your variable(s) in words (Let x = ...) and for you to give the units (for instance, "in dollars").

6. A second number is five times the first number. A third number is 100 more than the first number. If the sum of the three numbers is 306, find the numbers.

→ 415

Let x = 1st #, 5x is 2nd, x+100 is 3rd

$x + 5x + x + 100 = 415$

$7x + 100 = 415$

$7x = 315$

$x = \frac{315}{7} = 45$

$x = 45,\ 5x = 225,\ x + 100 = 145$

7. John bought an expensive book in a Pennsylvania bookstore for $304.82 (with tax). What's the price of the book before tax, if Pennsylvania sales tax is 6%?

→ 22

x = Price of book (dollars)

$x + .06x = 304.82$

$1.06x = 304.82$

$x = \frac{304.82}{1.06} \approx 291.34$

$x \approx \$291.34$

8. Solve $s = \frac{n}{2}(a + L)$ for L.

$2s = n(a + L)$

$2s = na + nL$

$2s - na = nL$

$\frac{2s - na}{n} = L$

9. **Recall:** The compound interest formula is $A = P\left(1 + \frac{r}{n}\right)^{nt}$, where

A = amount in the account after t years
P = principal or amount invested
t = time, in years
r = annual rate of interest
n = number of times compounded per year.

If a principal amount of $6,000 is invested in an account paying an annual percentage rate of 4%, find the amount in the account after 4 years, if the account is compounded monthly.

$A = 6000\left(1 + \frac{.04}{12}\right)^{(12)(4)} \approx \$7039.19$

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Solve.

5 10. $|9y+1|=6$

$9y+1=6$ OR $9y+1=-6$

$9y=5$ $\quad 9y=-7$

$y=\frac{5}{9}$ OR $y=-\frac{7}{9}$

$\left\{-\frac{7}{9}, \frac{5}{9}\right\}$

5 11. $|9y+1|=-6$

$\emptyset$

10 12. $|9y+1|=|6y+4|$

$9y+1=6y+4$ OR $9y+1=-6y-4$

$9y=6y+3$ $\quad 9y=-6y-5$

$3y=3$ $\quad 15y=-5$

$y=1$ OR $y=-\frac{1}{3}$

$\left\{-\frac{1}{3}, 1\right\}$

10

Solve. Write the final answer in interval notation.

5 13. $-3x \le 21$

$x \ge -7$

$[-7, \infty)$

5 14. $\left(\frac{5x+1}{7} - \frac{2x-6}{4} \ge -4\right)(28)$

$4(5x+1) - 7(2x-6) \ge -112$

$20x + 4 - 14x + 42 \ge -112$

$6x + 46 \ge -112$

$6x \ge -158$

$x \ge -\frac{158}{6} = -\frac{79}{3}$

$\left[-\frac{79}{3}, \infty\right)$

5 15. $|9y+1| > 6$

$9y+1 > 6$ OR $9y+1 < -6$

$9y > 5$ OR $9y < -7$

$y > \frac{5}{9}$ OR $y < -\frac{7}{9}$

$(-\infty, -\frac{7}{9}) \cup (\frac{5}{9}, \infty)$

5 17. $|9y+1| < 6$

$-6 < 9y+1 < 6$

$-1 \quad = \quad -1 \quad = -1$

$-7 < 9y < 5$

$-\frac{7}{9} < y < \frac{5}{9}$

$(-\frac{7}{9}, \frac{5}{9})$

Rina!

5 16. $|9y+1| > -6$

$\mathbb{R}$

5 18. $|9y+1| \le -6$

$\emptyset$

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