San José State University
Fall 2015
Math-8: College Algebra
Section 03: MW noon–1:15pm
Section 05: MW 4:30–5:45pm

Exam 1

Helpful Stuff

$A = P(1 + rt)$ $\qquad$ $s = s_0 + v_0 t + \frac{1}{2}at^2$

$A = P\left(1 + \frac{r}{n}\right)^{nt}$ $\quad$ $g = 32ft/s^2$ and $g = 9.8m/s^2$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

A1	Commutative Addition
A2	Associative Addition
A3	Additive Identity (0)
A4	Additive Inverse (-a)
M1	Commutative Multiplication
M2	Associative Multiplication
M3	Multiplicative Identity (1)
M4	Multiplicative Inverse (1/a)
RD	Right Distributive
LD	Left Distributive
CAN	Cancellation
SUB	Substitution

Name: _____

1. A careful solution of $4(x+2)=11$ is given below. Give the rationale for each step from the ten real number rules (A1–A4, M1–M4, LD, RD) and two additional rules (SUB, CAN). Note that some steps have two things to identify.

$4(x+2)=11$	
$4x+8=11$	_____, _____
$(4x+8)-8=11-8$	_____
$(4x+8)-8=3$	_____
$4x+(8-8)=3$	_____
$4x+0=3$	_____, _____
$4x=3$	_____, _____
$\frac{1}{4}(4x)=\frac{1}{4}(3)$	_____
$\frac{1}{4}(4x)=\frac{3}{4}$	_____
$(\frac{1}{4}4)x=\frac{3}{4}$	_____
$1x=\frac{3}{4}$	_____, _____
$x=\frac{3}{4}$	_____, _____

2. Solve for x, but do not use the quadratric formula:

$$\frac{\left[2x(x+5)^3\right]^2}{2x^2(x+5)^7}=-\frac{x}{3}$$

3. Simplify:

$$\frac{\sqrt{4x\sqrt[3]{(x+1)^4}}}{\sqrt[4]{x}(x+1)}$$

4. Expand: $(3xy - 4z)^2$

5. Simplify: $\sqrt{200x^2y} - \sqrt{50x^2y}$

6. Solve by completing the square. Do not use the quadratic formula.

$$2x^2 + 6x - 10 = 0$$

7. A man stands on a 100 ft cliff and throws a rock up in the air with a speed of 12 ft/s. How long does it take for the rock hit the ground? (Hint: You should set up your coordinate system so that 0 is the ground and up is the positive direction. Use the constant acceleration formula given on the first page and pick the appropriate value of g to plug in for a. Make sure that you use the correct sign for g.)

8. A woman is standing at the bottom of the cliff in problem (7). She throws a rock upwards just hard enough so that on its way up it passes the man on the cliff with a speed of 12 ft/s. How long does it take from the time that the rock leaves the woman's hand to the time that it hits the ground? (Hint: all the values that you need to solve this were calculated in problem 7).

9. You ask your friend the photographer to take your picture and give you a nice, glossy 8x12 square inch copy mounted in a nice frame. So that the frame doesn't damage the photo, you ask your friend to include a border around the picture that is the same width on all sides of the picture. The total area of the frame is 117 square includes. How wide is the border? (Hint: this is the same as the pool problem on the quiz 4 retake). Please show all work - do not guess!

10. You open a savings account that pays 3% annual interest, compounded monthly, with an initial deposit of $1000. You are a good saver, so you auto-deposit $500 from your paycheck every month. In the third month, you need to buy a new car, so you withdraw $750 to help with the down-payment. What is your account balance at the start of the fifth month (right after the fourth deposit)?