Name: Key
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MAC 1105.1A26
Cyr

Quiz 4
You must show all work to receive full credit!!

Problem 1. (2 pts) Solve the equation $x^2 - 4x - 2 = 0$ by any appropriate method.

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

$$x = \frac{-(-4) \pm \sqrt{(-4)^2-4(1)(-2)}}{2(1)} = \frac{4 \pm \sqrt{16+8}}{2}$$

$$= \frac{4 \pm \sqrt{24}}{2} = \frac{4 \pm 2\sqrt{6}}{2} = \boxed{2 \pm \sqrt{6}}$$

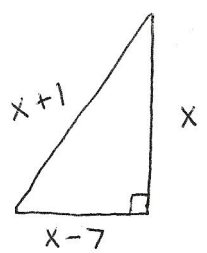
$$x^2 - 4x + 4 = 2 + 4 \quad \left(\frac{4}{2}\right)^2 = 4$$

$$(x-2)^2 = 6$$

$$x - 2 = \pm\sqrt{6}$$

$$\boxed{x = 2 \pm \sqrt{6}}$$

Problem 2. (1 pt) There is a right triangle with one leg 7 inches shorter than the other leg, and the hypotenuse is 1 inch longer than the longer leg. Write down **but do not solve** the equation that must be solved in order to determine the lengths of the sides. (Hint: draw a picture.)



$$(x-7)^2 + x^2 = (x+1)^2$$

Problem 3. (2 pts) A boat travels upriver to a landing and then returns to its starting point. The trip upriver takes 12 hours and the trip back takes 9 hours. If the average speed on the return trip is 5 mph faster than on the trip upriver, what is the boat's speed upriver? (Hint: make a table of the speed, time, and distance of the boat during the two different trips.)

	Rate	Time	Distance
Upriver	x	12	$12x$
Return	$x+5$	9	$9(x+5)$

$$d_{upriver} = d_{return} \Rightarrow$$

$$12x = 9(x+5)$$

$$12x = 9x + 45$$

$$3x = 45$$

$$\boxed{x = 15 \text{ mph}}$$