

Participation Activity 3 (M5,6)

Be sure to show your work for full credit!

1. You have \$5000 to invest and two funds that you'd like to invest in. The first fund yields 14% interest and the second yields 6% interest. If you earn \$450 in interest income this year, how much should you put into each fund? Make sure to indicate what amount goes into each account.

Let x = amount in 1st account

	P	R	T	$I = Prt$
1st	x	0.14	1	$0.14x$
2nd	$5000 - x$	0.06	1	$0.06(5000 - x)$

$$0.14x + 0.06(5000 - x) = 450$$

$$0.14x + 300 - 0.06x = 450$$

$$0.08x = 150$$

$$x = 150 / 0.08 \times 100 / 100 = \frac{15000}{8} = \frac{7500}{4} = \frac{3750}{2} = 1875$$

First fund: \$1875

Second fund: \$3,125

= 1875

2. John traveled against the wind in a small plane for 3 hours. The return trip with the wind took 2.8 hours. Find the speed of the wind if the speed of the plane in still air is 180 mph. Let x be the speed of the wind.

	r	t	$d = rt$
Against wind	$180 - x$	3 hrs	$3(180 - x)$
with wind	$180 + x$	2.8 hrs	$2.8(180 + x)$

$$3(180 - x) = 2.8(180 + x)$$

$$540 - 3x = 504 + 2.8x$$

$$36 = 5.8x$$

$$x = \frac{36}{5.8} \times 10$$

$$= \frac{360}{58} = \frac{180}{29}$$

$$x = \frac{180}{29} \approx 6.207$$

3. Find a right triangle whose three sides have lengths that are consecutive even integers. Hint: Let the smallest side of the triangle equal $2x$.

$$a = 2x, b = 2x + 2, c = 2x + 4$$

$a = 6$ $b = 8$ $c = 10$

$$(2x)^2 + (2x+2)^2 = (2x+4)^2$$

$$4x^2 + (2x+2)(2x+2) = (2x+4)(2x+4)$$

$$4x^2 + 4x^2 + 4x + 4x + 4 = 4x^2 + 8x + 8x + 16$$

$$4x^2 + 8x + 4 = 8x + 8x + 16$$

$$4x^2 - 8x - 12 = 0 \Rightarrow x^2 - 2x - 3 = 0$$

The lengths of the sides are: 6, 8, 10

$$(x-3)(x+1) = 0$$

$$x = 3, x = -1$$

(X)

4. Solve the equation by completing the square

$$\frac{2x^2 - x - 3}{2} = 0$$

$$x^2 - \frac{1}{2}x - \frac{3}{2} = 0$$

$$x^2 - \frac{1}{2}x = \frac{3}{2}$$

$$(x - 1/4)^2 = \frac{3}{2} + \frac{1}{16}$$

$$(x - 1/4)^2 = \frac{24}{16} + \frac{1}{16} = \frac{25}{16}$$

$$x - 1/4 = \pm \sqrt{25/16} = \pm 5/4$$

$$x = \pm 5/4 + 1/4$$

$$\left(-\frac{1}{2} \cdot \frac{1}{2}\right)^2 = \left(-\frac{1}{4}\right)^2 = \frac{1}{16}$$

$$\frac{3}{2} \times \frac{8}{8} = \frac{24}{16}$$

$$x = \frac{5}{4} + \frac{1}{4}, \frac{-5}{4} + \frac{1}{4}$$

$$x = \frac{6}{4}, -4/4$$

$$x = 3/2, -1$$

5. Determine whether the equation is an identity, a conditional equation, or a contradiction. Give the solution set.

$$15x^3 - 20 + 5 = 15x^3 - 3$$

$$-15 = -3$$

Never true

Type of equation: Contradiction Solution set: { \emptyset }

or {empty set}
or {no solution}