

# Problems from Group 3

## Workshop on Revitalizing College Algebra, 2007

- The population of the Sun Devils is given by the function
 
$$P(t) = 1000 - 20t,$$
 where  $t$  is time in years. Interpret each of the ordered pairs in terms of Sun Devils and time if possible.
 

(a) (0, 1000)	(b) (-40, 1800)
(c) (43, 140)	(d) (50, 0)
- Prices are increasing 5% per year. If time is measured in decades, then the price of a \$45 item in  $t$  decades is
 

(a) $\$45(1.05)^{0.1t}$	(b) $\$45(0.05)^{0.1t}$
(c) $\$45(0.05)^{10t}$	(d) $\$45(1.05)^{10t}$
(e) $\$45(1.05)^t$	(f) $\$45[(1.05)^{10}]^t$
(g) $\$45(1.005)^{10t}$	
- True or false? If false, explain the mistake. Assume  $a$  and  $b$  are any numbers.
 

(a) $2(a + b) = 2a + 2b$	(b) $2(a \cdot b) = 2a \cdot 2b$
(c) $(a \cdot b)^2 = a^2 \cdot b^2$	(d) $(a + b)^2 = a^2 + b^2$
(e) $\sqrt{a + b} = \sqrt{a} + \sqrt{b}$	(f) $\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$
- Write each of the following in an equivalent form without parentheses.
 

(a) $2(a + b)$	(b) $2(a \cdot b)$
(c) $(a \cdot b)^2$	(d) $(a + b)^2$
- If  $x > 0$ , will the following expressions be negative, zero, positive, or undefined?
 

(a) $(-x)^2$	(b) $-x^2$	(c) $-(x^2)$
(d) $(-x)^3$	(e) $-x^3$	(f) $-(x^3)$
(g) $\sqrt{x}$	(h) $\sqrt{-x}$	(i) $-\sqrt{x}$
(j) $\sqrt[3]{x}$	(k) $\sqrt[3]{-x}$	(l) $-\sqrt[3]{x}$
- If  $x < 0$ , will the following expressions be negative, zero, positive, or undefined?
 

(a) $(-x)^2$	(b) $-x^2$	(c) $-(x^2)$
(d) $(-x)^3$	(e) $-x^3$	(f) $-(x^3)$
(g) $\sqrt{x}$	(h) $\sqrt{-x}$	(i) $-\sqrt{x}$
(j) $\sqrt[3]{x}$	(k) $\sqrt[3]{-x}$	(l) $-\sqrt[3]{x}$
- Given
 
$$5x - 9 = \underline{\hspace{2cm}},$$
 write a linear expression to complete the equation so that there will be
 

(a) a positive solution	(b) a negative solution
(c) no solutions	(d) many solutions.

 Explain each choice.
- $$5x - 9 = ax + 2,$$
 determine the value(s) of  $a$ , if possible, such that the equation will have
 

(a) a positive solution	(b) a negative solution
(c) no solutions	(d) many solutions.

 Provide an explanation of your reasoning in each part.