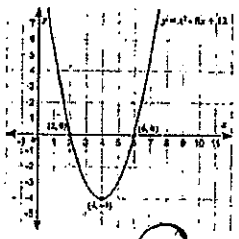
Name_____ Date_____

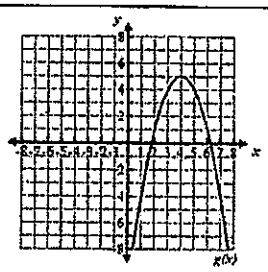
UNIT 8 **LESSON 12**

Do Now:



a) Identify the roots: {2, 6}

b) In words describe the nature of the roots: real, rational, unequal



(a) Identify the roots:

(b) In words describe the nature of the roots: real, irrational, unequal

AIM: SOLVING WORD PROBLEMS USING QUADRATIC EQUATIONS (Day 1)

1. Find three consecutive positive integers such that the product of the 1st and second is equal to 20.

$(1st)(2nd) = 20$

$x(x+1) = 20$

$x^2 + x = 20$

$-20 \quad -20$

$x^2 + x - 20 = 0$

$(x+5)(x-4) = 0$

$x+5=0 \quad | \quad x-4=0$

$-5 \quad -5 \quad | \quad +4 \quad +4$

$x = -5 \quad | \quad x = 4$

reject b/c (-)

Step 1: Write a legend from the question.

x = 1st C.P.I.

$x+1$ = 2nd C.P.I.

$x+2$ = 3rd C.P.I.

Step 2: Translate the question into an equation

Step 3: Solve the equation

Step 4: Plug solution into the legend

~~Step 4: Check~~

1st C.P.I. = 4

2nd C.P.I. = 5

3rd C.P.I. = 6

check:

$4(5) = 20$

$20 = 20$

2. The larger of two positive integers is 3 more than the smaller. If the product of the two numbers is 88, what are the two numbers?

Let x = smaller integer = 8

Let x+3 = larger integer = 11

Step 1: Write a legend from the question.
Step 2: Translate the question into an equation
Step 3: Solve the equation
Step 4: Plug solution into the legend
Step 4: Check

(smaller)(larger) = 88

$x(x+3) = 88$

$x^2 + 3x = 88$ Distribute

$-88 \quad -88$

$x^2 + 3x - 88 = 0$ Set = 0

$(x+11)(x-8) = 0$ Factor T-Bar

$x+11=0$	$x-8=0$
$-11 \quad -11$	$+8 \quad +8$
$x = -11$	$x = 8$

reject b/c (-)

check:
$8(11) = 88$
$88 = 88$

3. Find three consecutive positive EVEN integers such that the product of the 2nd and 3rd integer is equal to 22 more than the 1st.

Let x = 1st C.P.E.I. = 2

Let $x+2$ = 2nd C.P.E.I. = 4

Let $x+4$ = 3rd C.P.E.I. = 6

Step 1: Write a legend from the question.

x = 1st C.P.I.

$x+2$ = 2nd C.P.I.

$x+4$ = 3rd C.P.I.

Step 2: Translate the question into an equation

Step 3: Solve the equation

Step 4: Plug solution into the legend

Step 4: Check

(2nd C.P.E.I)(3rd C.P.E.I) = 1st C.P.E.I + 22

$(x+2)(x+4) = x+22$

$x^2+4x+2x+8 = x+22$

$x^2+6x+8 = x+22$

$-x \quad -x$

$x^2+5x+8 = 22$

$-22 \quad -22$

$x^2+5x-14 = 0$

$(x+7)(x-2) = 0$

$x+7=0$	$x-2=0$
$-7 \quad -7$	$+2 \quad +2$
$x=-7$	$x=2$

reject b/c it odd

check:

$4(6) = 2+22$

$24 = 24$ ✓

4. The square of a positive number is 20 more than the number itself. What is the number?

Let x = a number = 5

Step 1: Write a legend from the question.
Step 2: Translate the question into an equation
Step 3: Solve the equation
Step 4: Plug solution into the legend
Step 4: Check

$$x^2 = x + 20$$
$$-x \quad -x$$
$$x^2 - x = 20$$
$$-20 \quad -20$$
$$x^2 - x - 20 = 0$$
$$(x-5)(x+4) = 0$$

$x - 5 = 0$ | $x + 4 = 0$

$+5 \quad +5$ | $-4 \quad -4$

$x = 5$ | $x = -4$ reject plc (-)

check:

$(5)^2 = 5 + 20$

$25 = 25$ ✓