HW SOL PC 11 Difference of Squares

October 2, 2019 10:17 AM

Name:_____ Date:_____

Lesson 3 Factoring Difference of Squares $a^2-b^2=(a+b)(a-b)$

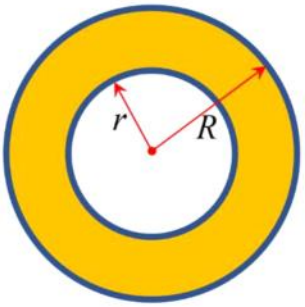
1. Factor each of the following expressions:

a) $9x^2-4y^2$ $(3x-2y)(3x+2y)$	b) $81a^2-25b^2$ $(9a-5b)(9a+5b)$	c) $16x^2-49y^2$ $(4x-7y)(4x+7y)$
d) $\frac{x^2}{16}-\frac{y^2}{49}$ $\left(\frac{x}{4}-\frac{y}{7}\right)\left(\frac{x}{4}+\frac{y}{7}\right)$	e) $27x^3-12xy^2$ $3x(3x-2y)(3x+2y)$	f) $50a^2b-98b^3$ $2b(5a-7b)(5a+7b)$
g) $(2x-1)^2-9x^2$ $(-x-1)(5x-1)$	h) $(2x-1)^2-(3x+2)^2$ $(-x-3)(5x+1)$	i) $(4x+3)^2-(x+5)^2$ $(3x-2)(5x+8)$
J) $4(2x-y)^2-25z^2$ $[2(2x-y)-5z][2(2x-y)+5z]$	k) $18x^2y^2-50y^4$ $2y^2(3x-5y)(3x+5y)$	L) $81a^2-(3a+2b)^2$ $(6a-2b)(12a+2b)$
m) $5x^4-80$ $5(x-2)(x+2)(x^2+4)$	n) $(4x^2-4)^2-81x^4$ $(-5x^2-4)(13x^2-4)$	o) $121x^2+36y^2$ $(11x+6y)(11x+6y)$ Factors (not (-))

2. Solve each of the following equations for "x" by factoring. Show all your work and steps:

a) $49x^2 - 16 = 0$	b) $288x^2 - 578 = 0$ $288x^2 - 578 = 0$ $2[144x^2 - 289] = 0$ $2(12x+17)(12x-17) = 0$ $12x+17=0$ $\quad x=\frac{17}{12}$ $12x=-17$ $x=\frac{-17}{12}$	c) $\frac{121x^2}{9} - \frac{64}{25} = 0$
d) $\frac{98x^2}{100} - \frac{18}{25} = 0$ $\frac{98x^2}{100} - \frac{18}{25} = 0$ $2\left[\frac{49x^2}{100} - \frac{9}{25}\right] = 0$ $2\left(\frac{7x}{10}+\frac{3}{5}\right)\left(\frac{7x}{10}-\frac{3}{5}\right) = 0$ $\frac{7x}{10}+\frac{3}{5}=0$ $\quad \frac{7x}{10}-\frac{3}{5}=0$ $\frac{7x}{10}=-\frac{3}{5}$ $\quad \frac{7x}{10}=\frac{3}{5}$ $7x=-6$ $\quad x=\frac{6}{7}$ $x=\frac{-6}{7}$	e) $(2x+7)^2 - (x-9)^2 = 0$	f) $(3x-1)^2 - (2x+5)^2 = 0$ $[(3x-1)+(2x+5)][(3x-1)-(2x+5)]=0$ $(5x+4)(x-6)=0$ $x=\frac{-4}{5}$ $\quad x=6$
$x^4 - 16x^6 = 0$ $x^4(x^2-16)=0$ $x^4(x+4)(x-4)=0$ $x=0$ $\quad x=-4$ $\quad x=4$	$x^4 - 13x^2 + 36 = 0$ $(x^2-9)(x^2-4)=0$ $x=\pm 3$ $\quad x=\pm 2$	$3x^4 - 15x^2 - 108 = 0$ $3(x^4-5x^2-36)=0$ $3(x^2-9)(x^2+4)=0$ $x=\pm 3$ $\quad$ No Real Soln

3. Two concentric circles are overlapping each other as shown in the diagram. Which of the following equations below provides the area between the two circles?



$eq\#1: A = (r+R)^2 \times \pi$

$eq\#2: A = (r+R)(r-R)\pi$

$eq\#3: A = (R+r)\times \pi^2$

$eq\#4: A = (R+r)(R-r)\times \pi$

$eq\#5: A = (R^2+r^2)\times \pi$

$\pi R^2 - \pi r^2$ = SHADED REGION

$\pi[R^2 - r^2]$ = SHADED

$\pi[R+r][R-r]$ = SHADED

4. What is the value of $1000^2 - 999^2 = (\square + \square)(\square - \square)$?

$1000^2 - 999^2$

$[1000 + 999][1000 - 999]$

$[1999](1)$

$= 1999$

5. The difference of two numbers is 20, and the difference of their squares is 800. What is the sum of the two numbers?

$x, y \rightarrow$ $x - y = 20$

$x^2 - y^2 = 800$

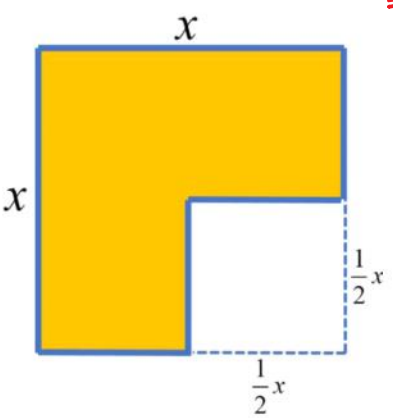
$x + y = ?$

$x^2 - y^2 = (x-y)(x+y)$

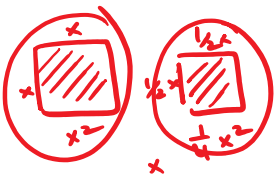
$800 = 20 \times (?)$

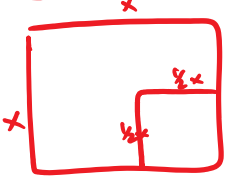
$40 = ?$

6. A square with a quarter of it cut out is shown below. If the remaining area is $27cm^2$, then what is the value of "x"?



#6)





$x^2 - \frac{1}{4}x^2$

$= (x + \frac{x}{2})(x - \frac{x}{2})$

$(\frac{3x}{2})(\frac{x}{2})$

$= \frac{3x^2}{4}$

$\frac{3x^2}{4} = 27$

$x^2 = 36$

$x = 6$

7. The positive difference of two perfect squares is 32. What are the possible values of these two perfect squares?

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$a^2 - b^2 = 32$

$(a+b)(a-b) = 32$

① 32×1

② 16×2

③ 8×4

① $a+b=32$, $a-b=1$

$2a = 33$

$a = \frac{33}{2} = 16.5$

(a^2 CAN'T BE P.S.)

② $a+b=16$, $a-b=2$

$2a=18$

$a=9$

$b=7$

$\therefore 81-49$

③ $a+b=8$, $a-b=4$

$2a=12$

$a=6$

$b=2$

$36-4$

8. What is $1,000,000^2 - 999,999^2$? Do not use a calculator.

$(1,000,000 + 999,999)(1,000,000 - 999,999)$

$= 1,999,999$ //

9. The number 2001 can be written as a difference of squares, $x^2 - y^2$ where "x" and "y" are positive integers in four different ways. What are the four possible ways?

10. Two numbers are such that their difference, their sum and their product are to one another as 1 : 7 : 18. The product of the two numbers are:

a) 6 b) 12 c) 24 d) 48 e) none of these

11. The number 2005 can be written in the form of $a^2 - b^2$, where "a" and "b" are positive integers less than 1000 in exactly one way. What is the value of $a^2 + b^2$?

#10)

$x-y : x+y : xy$

$1 : 7 : 18$

$\frac{x+y}{x-y} = \frac{7}{1}$

$\frac{xy}{x-y} = \frac{18}{1}$

$x+y = 7x - 7y$

$+7y \quad +7y$

A) $8y = 6x$

B) $24y = 18x$

$xy = 18x - 18y$ c)

$xy = 24y - 18y$ d)

$xy = 6y$ e)

$x = 6$ f)

$8y = 6(6)$

$y = \frac{36}{8} = \frac{9}{2} = 4.5$