#35

Name: Key Date: ________________

Factoring the Difference of Perfect Squares
Algebra 1 Homework

Skill

Factor and check mentally by multiplying:

1) $x^2 - 9 =$

$(x+3)(x-3)$

2) $b^2 - a^2 =$

$(b+a)(b-a)$

3) $r^2 - 144 =$

$(r+12)(r-12)$

4) $121p^2 - 1 =$

$(11p+1)(11p-1)$

5) $4 - g^2 =$

$(2+g)(2-g)$

6) $4x^2 - 25y^2 =$

$(2x+5y)(2x-5y)$

7) $9 - \frac{1}{4}x^2 =$

$(3-\frac{1}{2}x)(3+\frac{1}{2}x)$

8) $25p^2 - y^2 =$

$(5p-y)(5p+y)$

9) $x^2 - 49 =$

$(x+7)(x-7)$

Factor completely and check:

① GCMF
② Dps

10) $3x^2 - 3 =$

$3(x^2-1)$

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

11) $8x^2 - 2 =$

$2(4x^2-1)$

$2(2x+1)(2x-1)$

12) $6x^2 - 24 =$

$6(x^2-4)$

$6(x+2)(x-2)$

13) $4x^3 - 100x =$

$4x(x^2-25)$

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

14) $4x^2 - 400 =$

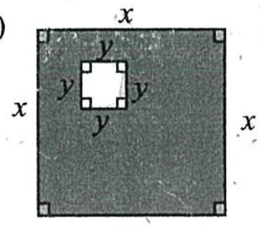
$4(x^2-100)$

$4(x+10)(x-10)$

Applications

15). For both of the following diagrams, express the shaded area as the product of two binomials. As a start, first express the area as the difference of perfect squares.

(a)



SA = AOL − AOS

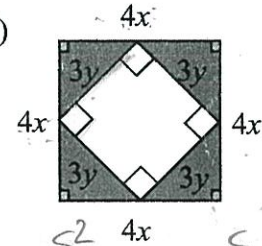
$A = s^2$

$s^2 - s^2$

$x^2 - y^2$

$(x+y)(x-y)$

(b)



$s^2 - s^2$

$(4x)^2 - (3y)^2$

$16x^2 - 9y^2$

$(4x+3y)(4x-3y)$

Reasoning

16) Which of the following represents the binomial $4x^2 - 16$ factored completely?

(1) $4(x^2-4)$ (3) $4(x+2)(x-2)$

(2) $(x-2)(x+2)$ (4) $(2x+4)(2x-4)$

$4(x^2-4)$

$4(x+2)(x-2)$

3

17). Which of the following represents the binomial $50-2x^2$ factored completely?

(1) $25(2-x^2)$ (3) $2(x-5)(x+5)$

(2) $5(5-x)(5+x)$ (4) $2(5+x)(5-x)$

$2(25-x^2)$

$2(5+x)(5-x)$

4

18). Although we have discussed the difference of perfect squares, we have not considered the sum of perfect squares. Consider the following sum of two perfect squares.

$$x^2+25$$

(a) By multiplying each of the following binomials, determine which, if any, is the factored form of the binomial above.

$(x+5)(x+5)=$

$x^2+5x+5x+25$

$x^2+10x+25$ NO

$(x-5)(x-5)=$

$x^2-5x-5x+25$

$x^2-10x+25$ NO

(b) Since these are the only logical choices for this factoring, and neither of them works, we say that this binomial cannot be factored. What is the name we give integers that cannot be factored?

*prime polynomial

prime polynomial

12

2 6

2 3

Prime