

Name: key

Date: \_\_\_\_\_

1) Simplify:  $(5x^2y^3)^4(-2xy^{-2})^2$

$$(5^4 x^8 y^{12}) ((-2)^2 x^2 y^{-4})$$

$$(625 x^8 y^{12}) (4 x^2 y^{-4})$$

$$\boxed{2500 x^{10} y^8}$$

2) Simplify:  $\frac{(2a^5b^{-7})^3}{18a^{-3}b^4}$

$$\frac{8 a^{15} a^3}{18 b^4 b^{21}}$$

$$\frac{2^3 a^{15} b^{-21}}{18 a^{-3} b^4}$$

$$\boxed{\frac{4 a^{18}}{9 b^{25}}}$$

$$\frac{8 a^{15} b^{-21}}{18 a^{-3} b^4}$$

3) Multiply:  $(2x^2 - 3x)(4x^3 + 5x)$

$$8x^5 + 10x^3 - 12x^4 - 15x^2$$

$$\boxed{8x^5 - 12x^4 + 10x^3 - 15x^2}$$

4) Multiply:  $(3x^3 - 4x^2 + 8)(x - 7)$

$$3x^4 - 21x^3 - 4x^3 + 28x^2 + 8x - 56$$

$$\boxed{3x^4 - 25x^3 + 28x^2 + 8x - 56}$$

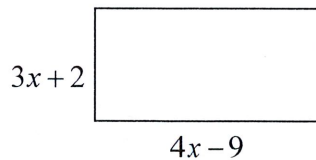
5) GCF Factor:  $16x^4 + 72x^3 - 56x^2$

$$8x^2(2x^2 + 9x - 7)$$

6) GCF Factor:  $21a^5b^2 - 15a^4b^2 + 12a^3b^2$

$$3a^3b^2(7a^2 - 5a + 4)$$

7) Find the area and perimeter of the rectangle:



Area =  $(3x+2)(4x-9)$

$$12x^2 - 27x + 8x - 18$$

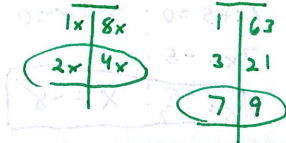
$$\boxed{12x^2 - 19x - 18}$$

Perimeter:  $(3x+2) + (4x-9) + (3x+2) + (4x-9)$

$$3x+2 + 4x-9 + 3x+2 + 4x-9$$

$$\boxed{14x - 14}$$

8) If a rectangle has an area of  $8x^2 - 22x - 63$ , what are the length and width?



$$\boxed{(2x-9)(4x+7)}$$

Completely factor the following:

9)  $x^2 + 12x + 35$

$(x+7)(x+5)$

11)  $3x^2 + 3x - 216$

$3(x^2 + x - 72)$   
 $3(x+9)(x-8)$

13)  $9x^2 - 121y^2$

$(3x+11y)(3x-11y)$

15)  $12x^2 - 243$

$3(4x^2 - 81)$   
 $3(2x+9)(2x-9)$

10)  $x^2 - 14x + 48$

$(x-8)(x-6)$

12)  $x^2 - 196$

$(x+14)(x-14)$

14)  $5x^2 - 40x - 45$

$5(x^2 - 8x - 9)$   
 $5(x-9)(x+1)$

16)  $7x^2y^4 - 21xy^4 + 14y^4$

$7y^4(x^2 - 3x + 2)$   
 $7y^4(x-2)(x-1)$

Solve the following:

17)  $x^2 - 2x - 35 = 0$

$(x-7)(x+5) = 0$

$x-7=0 ; x+5=0$

$x=7 ; x=-5$

18)  $9x^2 - 4 = 0$

$(3x+2)(3x-2) = 0$

$3x+2=0 ; 3x-2=0$

$3x=-2 ; 3x=2$

$x=-\frac{2}{3} ; x=\frac{2}{3}$

19)  $7x^2 - 12 = -17x$

$7x^2 + 17x - 12 = 0$

$(7x-4)(x+3) = 0$

$7x-4=0 ; x+3=0$

$7x=4 ;$

$x=\frac{4}{7} ; x=-3$

20)  $3x^2 - 16x = -5$

$3x^2 - 16x + 5 = 0$

$(3x-1)(x-5) = 0$

$3x-1=0 ; x-5=0$

$3x=1 ;$

$x=\frac{1}{3} ; x=5$

21)  $4x^2 - 28x - 32 = 0$

$4(x^2 - 7x - 8) = 0$

$4(x-8)(x+1) = 0$

$4=0 ; x-8=0 ; x+1=0$

Nope!  $x=8 ; x=-1$

22)  $7x^2 + 61x = -40$

$7x^2 + 61x + 40 = 0$

$(7x+5)(x+8) = 0$

$7x+5=0 ; x+8=0$

$7x=-5 ;$

$x=-\frac{5}{7} ; x=-8$

23)  $6x^2 - 96 = 0$

$6(x^2 - 16) = 0$

$6(x+4)(x-4) = 0$

$6=0 ; x+4=0 ; x-4=0$

Nope!  $x=-4 ; x=4$

24)  $3x^2 + 2x = 0$

$x(3x+2) = 0$

$x=0 ; 3x+2=0$

$3x=-2$

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