ALGEBRA 1 NAME _____
Second Semester Study Guide PERIOD _____

1) Find the prime factorization of 91.

2) Find the GCF of $-35a^2$ and $56ab$.

3) Factor completely $44x^2y^2 + 12x^2y - 16xy^2$.

$4xy(11xy + 3x - 4y)$

4) Solve $25x^2 - 100x = 0$.

$25x(x-4)=0$

$25x=0$ $\quad x-4=0$

$\div 25 \quad \div 25$ $\quad +4 \quad +4$

$x=0$ $\quad x=4$

$\{0,4\}$

5) Solve $y^2 = 14y - 48$.

$-14y+48 \quad -14y+48$

$y^2 - 14y + 48 = 0$

$(y-8)(y-6)=0$

$\times 48$	$+-14$
$-8, -6$	

$y-8=0$ $\quad y-6=0$

$+8 \quad +8 \quad +6 \quad +6$

$y=8 \quad y=6$

$\{8,6\}$

6) Factor completely $5d^2 + 6d - 8$.

$(5d^2 - 4d)(+10d - 8)$

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

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

$x \cdot 40$	$+6$
$-4, 10$	

7) Factor completely $y^2+13y+30$

$(y+10)(y+3)$

$\times 30$	$+13$
$10, 3$	

8) Factor completely $b^2 + b - 20$.

$(b+5)(b-4)$

$\times -20$ | $+1$

$5, -4$

9) Factor completely $5x^2 - 9x + 4$.

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

$5x(x-1) - 4(x-1)$

$(5x-4)(x-1)$

X 20	+ -9
-5, -4	

10) Factor completely, if possible. If polynomial cannot be factored, choose *prime*. $90x^2y - 100xy^2$.

$10xy(9x - 10y)$

11) Factor $x^2 - 6x - 27$

$(x-9)(x+3)$

$X \cdot -27 \mid +-6$

$-9, 3$

12) Simplify $\frac{20x^2y}{35xy^2}$.

$\frac{4x}{7y}$

13) State the excluded values of $\frac{a^2 + 3a - 28}{a^2 - 3a - 4}$.

$a^2 - 3a - 4 = 0$

$(a-4)(a+1) = 0$

$a - 4 = 0$ $\quad a + 1 = 0$

$+4 \quad +4$ $\quad -1 \quad -1$

$a = 4$ $\quad a = -1$

x	-4	$+3$
	$-4, 1$	

excluded values

$4, -1$

14) Simplify $\frac{6x^2 - 10x + 4}{2x^2 - 6x + 4}$.

$$\frac{2(3x^2-5x+2)}{2(x^2-3x+2)}$$

x	6	+-5
-3, -2		

x	2	+-3
-2, -1		

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

$3x(x-1)-2(x-1)$

$(3x-2)(x-1)$

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

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

15) Simplify $\frac{x^4}{7x^2 - 7y^2} \bullet \frac{x + y}{x^5 + x^4}$.

$$\frac{x^4}{7(x^2-y^2)} \cdot \frac{x+y}{x^4(x+1)}$$

$$\frac{x^4}{7(x-y)(x+y)} \cdot \frac{x+y}{x^4(x+1)} = \frac{1}{7(x-y)(x+1)}$$

16) Simplify $\frac{8m^2n}{p^2} \div \frac{m^3n^2}{6p^5}$.

$$\frac{8m^2n}{p^2} \cdot \frac{6p^5}{m^3n^2} = \frac{48p^3}{mn}$$

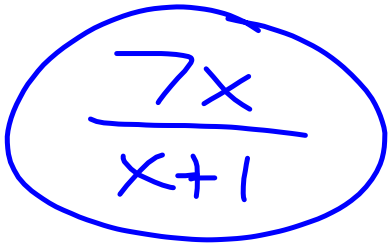
17) Factor $x^2 - 7x + 12$

$\times 12 \mid +{-7}$

$-4, -3$

$(x-4)(x-3)$

18) Simplify $\frac{5x}{x+1} + \frac{2x}{x+1}$.



19) Simplify $\frac{x-5}{9} - \frac{x-6}{9}$.

$\frac{x-5}{9} + \frac{-x+6}{9}$

$\frac{1}{9}$

20) Simplify $5\sqrt{7} - 2\sqrt{7}$

21) If x = 3 and 3x + y = 7, what is the value of y?

$3(3)+y=7$

$9+y=7$

$-9 \quad -9$

$y=-2$

22) Solve the system $n = 4m - 14$, $2m + 3n = 0$

$2m + 3(4m - 14) = 0$

$2m + 12m - 42 = 0$

$14m - 42 = 0$

$+42 \quad +42$

$\frac{14m}{14} = \frac{42}{14}$

$m = 3$

$n = 4(3) - 14$

$n = 12 - 14$

$n = -2$

$(3, -2)$

23) Solve the system

$$\begin{aligned} x + 7y &= 12 \\ -1(x + 6y &= 9) \end{aligned}$$

$$\begin{aligned} x+7y &= 12 \\ -x-6y &= -9 \end{aligned}$$

$y = 3$

$x+7(3)=12$

$x+21=12$

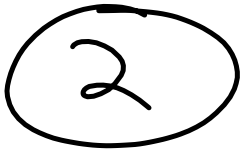
$-21 \quad -21$

$x=-9$

$(-9, 3)$

24) To eliminate the variable y in the system of equations, Multiply the second equations by what number?

$8x + 6y = 24$
$4x - 3y = 12$



25) Find the two numbers whose sum is 36 and whose difference is 24.

$x + y = 36$
$x - y = 24$

$2x = 60$
$\frac{2x}{2} = \frac{60}{2}$
$x = 30$

$30 + y = 36$
$-30 \quad -30$
$y = 6$

30, 6

26) If $x = 3y + 6$ and $2x - 5y = 10$, what is the value of y?

27) Simplify $(x^5)^3$

28) Solve the system for y $6x + 8y = -24$ and $4x - 10y = 156$.

29) Express 6.32×10^{-5}

30) Simplify $\sqrt{160}$

31) Simplify $(4d^4)(-3d^3)$.

32) Simplify $(-3xy^3)^2(4x^4y^2)^3$.

33) Simplify $\frac{5n^{-4}y}{10n^{-3}y^{-5}}$. Assume the denominator is not equal to zero.

34) Find the degree of the polynomial $5x^3y^2 - 4x^2y^2 + 9x^4y^2$.

35) Arrange the terms of $5x^4y^3 + 12x^2y^2 - 3x^3y + 6$ so that the powers of x are in ascending order.

36) Find $(4c^2 - 9c + 5) + (3c^2 - 9c - 16)$.

37) Find $(x + 3)(x + 7)$.

38) Find $(5y + 3z)(5y - 3z)$

39) Solve $x(2x + 4) - 4 = 2 + x(2x + 1)$

40) Find $(4x + 3)(2x^2 - 5x - 9)$.

41) Write $x+\frac{x+4}{x+7}$ as a rational expression.

42) Simplify $\sqrt{200}$

43) Simplify $\sqrt{50x^{10}y^5}$

44) Determine whether the following side measures form a right triangle.

14, 48, 50

45) Find the distance between the pair or points whose coordinates are given

(7, 3), (-4, 11)

46) Simplify $\frac{8}{3 - \sqrt{2}}$

47) Simplify $2\sqrt{50} - 3\sqrt{32}$

48) Solve $\sqrt{3x-3}-6=9$

49) If c is the measure of the hypotenuse of a right triangle, find the missing value. If necessary, round to the nearest hundredth.
a = 8, b = 15, c = ?

50) If c is the measure of the hypotenuse of a right triangle, find the missing value. If necessary, round to the nearest hundredth.
c = 14, a = 9, b = ?