Algebra 1 (CP) Name KEY

Final Exam Review #1 (Chapters 6-8)

Date _____ Period ____

Solve and Check each equation. There are 2 "No Soutions".

1) $8n - 10 = n + 4$

{2}

2) $-2x + 7x = 3x + 2 + 4x - 14$

{6}

$5x = 7x - 12$
$-7x \quad -7x$
$-2x = -12$
$\frac{-2x}{-2} = \frac{-12}{-2}$
$x = 6$

STEP1: SIMPLIFY BOTHSIDES
STEP2: GET VARIABLE ON 1 SIDE
STEP3: 2 STEP EQUATION
* UNDO +, −
* THEN UNDO ×, ÷
STEP4: CHECK IN THE ORIGINAL EQUATION

C: $-2(6) + 7(6) = 3(6) + 2 + 4(6) - 14$
$30 = 30$ ✓

3) $6x - 7 = -(-7x - 2)$

{−9}

4) $48 - 4x = 6(x - 2)$

{6}

$-4x + 48 = 6x - 12$
$+4x \quad +4x$
$48 = 10x - 12$
$+12 \quad +12$
$\frac{60}{10} = \frac{10x}{10}$
$x = 6$

C: $48 - 4(6) = 6(6 - 2)$
$24 = 24$ ✓

5) $3(7 + 8b) = 9(-9 - 3b)$

{−2}

6) $-4 - 2n = -2(n - 1) + 2$

SPECIAL CASE

$-2N - 4 = -2N + 2 + 4$
$-2N - 4 = -2N + 6$
$+2N \quad +2N$
$-4 = 6$ F

When the variable drops out and the numbers are not EQUAL THEN

N = NO SOLUTION

7) $-(4n-10) = 2 + 4(n-4)$

DISTRIBUTE(-1)

order of operations
① ( )'s IN → OUT
② Exponents
③ ×, ÷ L → R
④ +, − L → R

{3}

$-4N+10 = 2+4N-16$

$-4N+10 = 4N-14$

$+4N \quad +4N$

$10 = 8N - 14$

$+14 \quad +14$

$\frac{8N}{8} = \frac{24}{8}$ $N=3$

C: $-(4(3)-10) = 2+4(3-4)$

$-2 = -2$ ✓

8) $|x| = 2$

$X = \{2, -2\}$

C: $|2| = 2$

$2 = 2$ ✓

C: $|-2| = 2$

$2 = 2$ ✓

ABSOLUTE VALUE EQUATIONS

3 Forms #'s 8 – 10

ⓐ $|x| =$ +number

2 solutions

$X = \pm$ number

ⓑ $|x| = 0$

1 solution $X = 0$

ⓒ $|x| =$ −number

$X =$ NO SOLUTION

9) $|b| = 0$

$B = \{0\}$

C: $|0| = 0$

$0 = 0$ ✓

10) $|n| = -7$

$N =$ No solution.

Absolute value can not be negative

Chapter 6 -
Draw a graph for each inequality.

rewrite: Variable Symbol #

11) $m \le 1$

12) $6 \ge x$ → $x \le 6$

13) $x > -1$

14) $-3 < n$ → $n > -3$

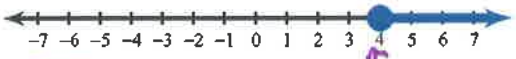
Write an inequality for each graph.

15)

$x < 2$

open dot
>, <, ≠

16)



$x \ge 4$

closed dot
≥, ≤, =

Solve each inequality AND GRAPH its solution.

17) $-1 < r - 4$ → $3 < R$ (rewrite)

$+4 \quad +4$

$r > 3$:

Graph

18) $-3 < \frac{n}{5}$ (5) → $-15 < N$ (rewrite)

$n > -15$:

Graph

SOLVE INEQUALITIES LIKE EQUATIONS. ADD RULES:

① When you multiply or divide variables by a negative number reverse the direction of THE SYMBOL.

② Graph the solution

Solve each inequality and graph its solution.

19) $-9 - 2x > 2(x - 2) - 1$

$x < -1$:

20) $-3(1 + 2x) > 2(-x - 2) - 3$

$x < 1$:

$-3 - 6x > -2x - 4 - 3$

$-6x - 3 > -2x - 7$

$+2x \quad +2x$

$-4x - 3 > -7$

$+3 \quad +3$

$-4x > -4$

$-4 \quad -4$

← Reverse the symbol

$x < 1$

Solve each compound inequality and graph its solution. (6pts each)

21) $4 < 4m - 4 \leq 8$

$2 < m \leq 3$:

22) $-3 < -4n + 5 \leq 25$ ← "AND" COMPOUND INEQ.

$-5 \leq n < 2$:

$-3 < -4N + 5 \leq 25$

$-5 \quad -5 \quad -5$

$-8 < -4N \leq 20$

$-4 \quad -4 \quad -4$

reverse symbol

① Isolate N

② perform the same operation to ALL 3 parts

$2 > N \geq -5$

↓ rewrite

$-5 \leq N < 2$

small ∞ | use only ≤, < | large ∞

23) $4r + 3 \geq -r + 3$ or $3r - 5 > 3 + 5r$

$r \geq 0$ or $r < -4$:

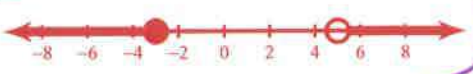
"OR" means either inequality is TRUE.

FOR #24 " X IS ALL THE NUMBERS LESS THAN OR EQUAL TO -3 PLUS ALL THE NUMBERS GREATER THAN 5

24) $-2 - 3x \geq 4 - x$ or $-5 + 5x > 3x + 5$

"OR"

$x \leq -3$ or $x > 5$:



Bring down the OR.

$-2 - 3x \geq 4 - x$

$+x \quad +x$

$-2 - 2x \geq 4$

$+2 \quad +2$

$-2x \geq 6$

$\frac{-2x}{-2} \geq \frac{6}{-2}$

$-5 + 5x > 3x + 5$

$-3x \quad -3x$

$-5 + 2x > 5$

$+5 \quad +5$

$\frac{2x}{2} > \frac{10}{2}$

$x \leq -3$ OR $x > 5$

Solution (graph above)

25) $5 + 3x > 4x - 5$ and $1 - 5x \leq 4 - 2x$

$5 + 3x > 4x - 5$

$-4x \quad -4x$

$5 - x > -5$

$-5 \quad -5$

$-x > -10$

$\frac{-x}{-1} > \frac{-10}{-1}$

reverse ↓ symbol

BRING DOWN THE AND

$1 - 5x \leq 4 - 2x$

$+2x \quad +2x$

$1 - 3x \leq 4$

$-1 \quad -1$

$-3x \leq 3$

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

reverse ↓ symbol

$x < 10$ AND $x \geq -1$

26) $b - 1 < -5$ and $-2b - 4 \leq 6$

$b < -4$ AND $b \geq -5$

"AND" means both inequalities MUST BE TRUE. IT IS WHERE THEY INTERSECT.

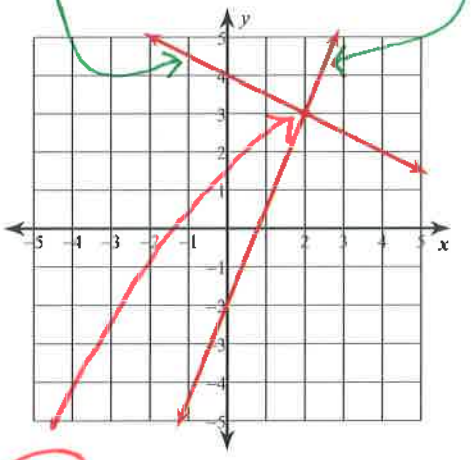
FOR #25 " X IS ALL THE NUMBERS BETWEEN -1 AND LESS THAN 10

Chapter 7

Solve each system by graphing. Check!

27) $y = \frac{5}{2}x - 2$ $m = \frac{5}{2}$ $b = -2$

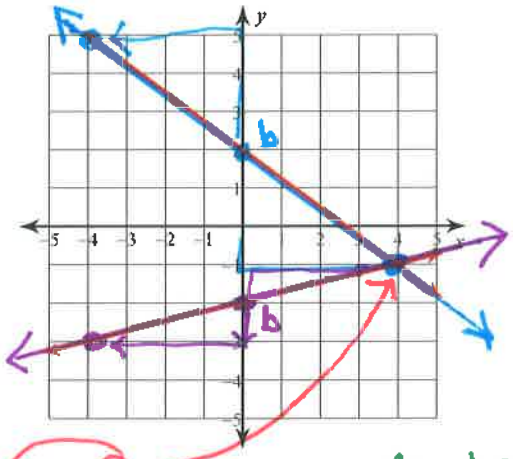
$y = -\frac{1}{2}x + 4$ $m = \frac{-1}{2}$ $b = 4$



(2, 3)

28) $y = -\frac{3}{4}x + 2$ $m = \frac{-3}{4}$ $b = 2$

$y = \frac{1}{4}x - 2$ $m = \frac{1}{4}$ $b = -2$



(4, −1) Solution $x = 4$ $y = -1$

C: $-1 = \frac{-3}{4}(4) + 2$

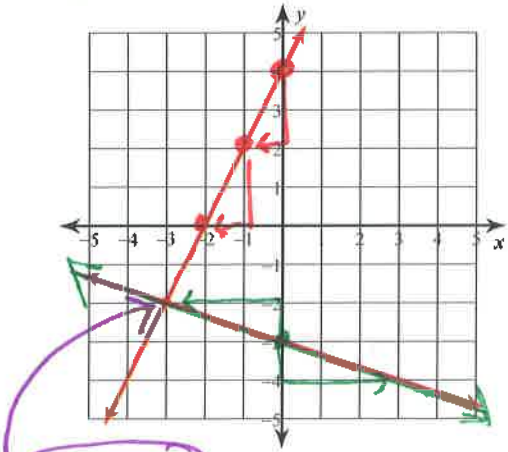
$-1 = -1$ ✓

C: $-1 = \frac{1}{4}(4) - 2$

$-1 = -1$ ✓

29) (a) $x + 3y = -9$

(b) $2x - y = -4$



(−3, −2)

(a) $x + 3y = -9$

$-x \quad\quad -x$

$\frac{3y}{3} = \frac{-x}{3} - \frac{9}{3}$

$y = -\frac{1}{3}x - 3$

(b) $2x - y = -4$

$-2x \quad -2x$

$\frac{-y}{-1} = \frac{-2x}{-1} - \frac{4}{-1}$

$y = 2x + 4$

GRAPHING SYSTEMS

1. PUT EQUATIONS IN $y = mx + b$
2. Plot the y-intercept (0, b)
3. USE slope to plot 2 more points

$m = \frac{\text{RISE}}{\text{RUN}}$

4. FIND THE ORDERED PAIR WHERE THEY INTERSECT (X, Y)
5. Check solution IN BOTH ORIGINAL EQUATIONS

Solve each system by substitution. Check!

30) $y = -4x + 28$
$-2x + 5y = 8$

(6, 4) Substitute

$-2x+5(-4x+28)=8$
$-2x-20x+140=8$
$-22x+140=8$
$-140 \quad -140$
$-22x=-132$
$-22 \quad -22$
$x=6$

Now Find y:
$y=-4(6)+28$
$y=4$

Remember to check!!

Check in Both Equations
C: $4=-4(6)+28$
$4=4$ ✓
C: $-2(6)+5(4)=8$
$8=8$ ✓

Solve each system by elimination. Check!

31) $-2x-7y=15$
$4x+7y=-23$ +

opposite coefficients for 1 variable
Then add down

$2x=-8$
$\frac{2}{2} \quad \frac{-8}{2}$
$x=-4$

Find y:
$4(-4)+7y=-23$
$-16+7y=-23$
$+16 \quad +16$
$7y=-7$
$\frac{7y}{7}=\frac{-7}{7}$
$y=-1$

32) $-x+3y=-7$
$-1(-5x+3y=13)$

1 variable has same coef
multiply 1 eq by -1

$-x+3y=-7$
$5x-3y=-13$ +
$4x=-20$
$\frac{4x}{4}=\frac{-20}{4}$
$x=-5$

Find y:
$-5(-5)+3y=13$
$25+3y=13$
$-25 \quad -25$
$3y=-12$
$\frac{3y}{3}=\frac{-12}{3}$
$y=-4$

33) $-5x+4y=10$ → $-5x+4y=10$ +
$-1(-5x+y=-5)$ → $5x-y=5$

(2, 5)
x y

Keep going

34) $(-3x-2y=1)\cdot 4$
$(4x-3y=-7)\cdot 3$

No common coef. multiply both eqs

$-12x-8y=4$
$12x-9y=-21$ +
$-17y=-17$
$\frac{-17y}{-17}=\frac{-17}{-17}$
$y=1$

Find x:
$4x-3(1)=-7$
$4x-3=-7$
$+3 \quad +3$
$4x=-4$
$\frac{4x}{4}=\frac{-4}{4}$
$x=-1$

Check:
C: $-3(-1)-2(1)=1$
$1=1$ ✓
C: $4(-1)-3(1)=-7$
$-7=-7$ ✓

35) $\begin{cases} 4x - 3y = 10 \\ 3x - 4y = 11 \end{cases}$ $\times 3 \rightarrow 12x - 9y = 30$, $\times -4 \rightarrow -12x + 16y = -44$

$(1, -2)$

$x = 1$

$y = -2$

36) $\begin{cases} -3x + 3y = -12 \\ 2x - 4y = 10 \end{cases}$ $\times 2 \rightarrow -6x + 6y = -24$, $\times 3 \rightarrow 6x - 12y = 30$

$(3, -1)$

$x = 3$

$y = -1$

Chapter 8

Simplify. Your answer should contain only positive exponents.

37) $3y^1 \cdot 4x^2y^4$ (1) mult numbers (2) same base, add exponents

$3 \cdot 4\, x^2\, y^{1+4}$

$12x^2y^5$

38) $-4x \cdot 2xy^4$

$-8x^2y^4$

39) $-2x^2y^3 \cdot -3xy$

$6x^3y^4$

40) $(4xy^3)^2$ ← power to power distribute 2

$16x^2y^6$

41) $(-3x^3y^4)^4$ DISTRIBUTE

$(-3)^4\, x^{3\cdot4}\, y^{4\cdot4}$

$81\, x^{12}\, y^{16}$

CALC

$(-3)\wedge 4$

↑ remember ()'s with negative numbers

42) $(-2m^4n^2)^3$ Distribute

$(-2)^3\, m^{4\cdot3}\, n^{2\cdot3} =$

$-8m^{12}n^6$

43) $2y^0 \cdot 3x^3y^0 \cdot x$

$6x^4$

$y^0 = 1$

anything to the zero exponent is 1

44) $x^3y^4 \cdot (yx^2)^0$ → 1

x^3y^4

45) $2xy^3 \cdot (2x^4y^2)^3$ ← follow order of operations

$2xy^3 \cdot 2^{1\cdot3} x^{4\cdot3} y^{2\cdot3} =$

$2xy^3 \cdot 2^3 x^{12} y^6 =$ ← Now add exponents and multiply numbers

$2 \cdot 8\, x^{1+12} y^{3+6}$

$16x^{13}y^9$

Simplify. Leave answers with improper fractions and only positive exponents.

46) $-\dfrac{4x^3y^3}{x^2y^2}$ Division • Same base subtract exponents

$-4xy$

47) $-\dfrac{2a^5}{5a^5}$ (1)

$-\dfrac{2}{5}$

Simplify. Your answer should contain only positive exponents.

48) $\dfrac{4x^3}{2xy^4}$ ← use only positive exponents. More y's in bottom so keep y's in denominator

$\dfrac{2x^2}{y^4}$

49) $\dfrac{1 \cdot m^3}{2m^3}$ implied 1 (1)

$\dfrac{1}{2}$

50) $-\dfrac{4xy^2}{3x^4y^3}$ ← More x's & y's in bottom. (subtract exponents AND keep in the part of the fraction with more.

$-\dfrac{4}{3x^3y}$

51) $\left(\dfrac{m^3n^4}{m^2}\right)^2$ ← (1) simplify ( )'s (2) distribute

$(mn^4)^2 = m^{1\cdot2}n^{4\cdot2} = m^2n^8$

52) $\left(\dfrac{x}{y^2}\right)^2$ Distribute

$\dfrac{x^2}{y^4}$

53) $\left(\dfrac{2v^4}{2u^2}\right)^4$ Distribute

$\dfrac{v^{16}}{u^8}$

54) $\dfrac{2x^2}{y^{-4}}$

$2x^2y^4$

Negative → Positive Exponents

- Just swap between top & bottom
- Don't swap numbers or variables with positive exponents

55) $-\dfrac{4x^4y^4}{2yx^4}$ divide numbers subtract exponents

$-2y^3$

56) $\dfrac{3y^{-3}}{-2x^4}$

$\dfrac{3}{-2x^4y^3}$