FINAL REVIEW # 2 ANSWER KEY

Chapter 7 pg 944 #'s 13, 16, 17, 35, 36

SOLVE THE LINEAR SYSTEM USING ELIMINATION

(13) $x + 2y = 2$
$-x + 3y = 13$
$5y = 15$
$y = 3$

ADD When coefs for ± variable are opposites ↓ DOWN

FIND X:
$x + 2(3) = 2$
$x + 6 = 2$
$x = -4$

$(-4, 3)$

(16) $5x + 4y = 6$
$7x + 4y = 14$ $\times -1 \rightarrow -7x - 4y = -14$
$-2x = -8$
$x = 4$

Same Coef then mult 1 EQ BY -1

FIND Y:
$5(4) + 4y = 6$
$4y = -14$
$y = -3.5$

$(4, -3.5)$

(17) $10y - 3x = -41$
$3x - 5y = +16$

Both EQUATIONS must be in STANDARD FORM $Ax+By=C$

$-3x + 10y = -41$
$3x - 5y = +16$
$5y = -25$
$y = -5$

FIND X

$3x - 5(-5) = 16$
$3x + 25 = 16$
$3x = -9$
$x = -3$

$(-3, -5)$

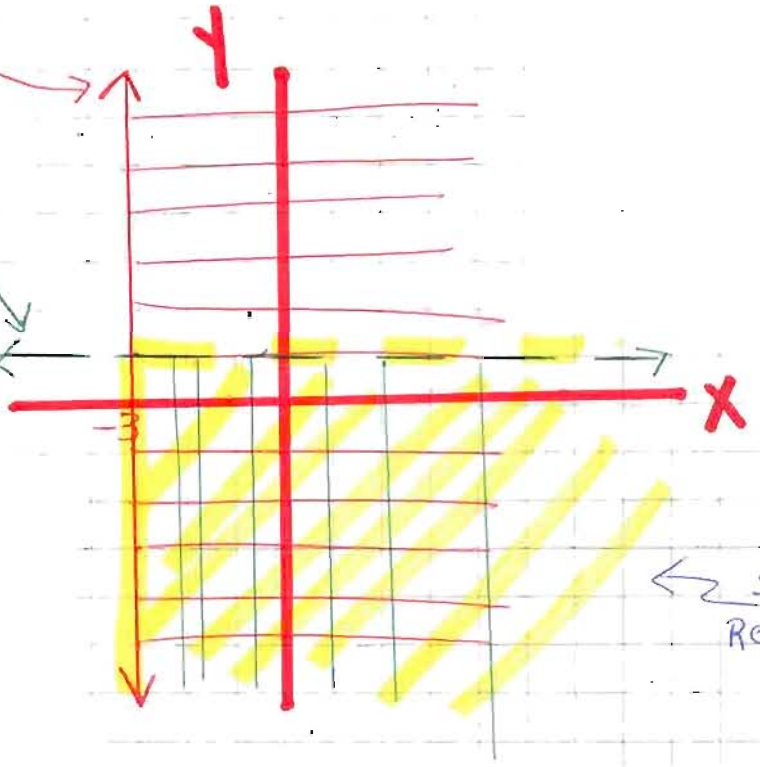
Chapter 7

GRAPH THE SYSTEMS OF INEQUALITIES

(35) $x \geq -3$
$y < 1$

≥ means solid line

< means dashed line



← SOLUTION Region

(36) $y < -2x - 3$

$y = mx + b$

Test (0,0)

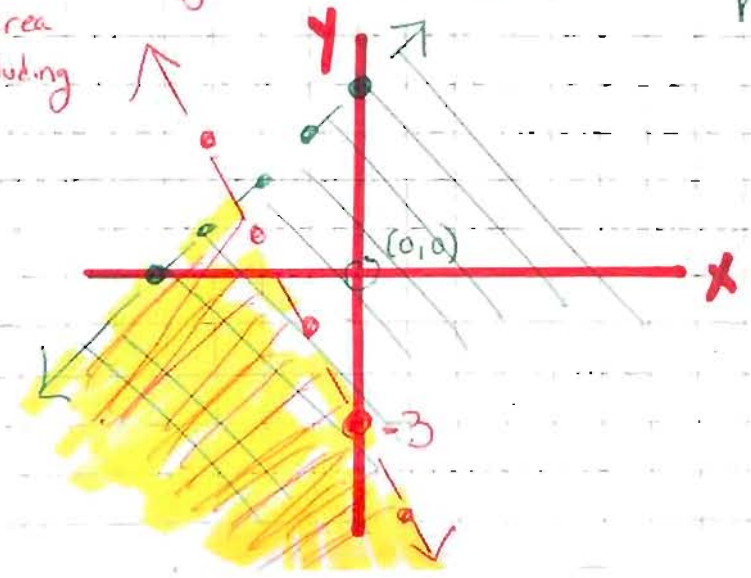
$0 < -2(0) - 3$

$0 < -3$ F

Shade area not including (0,0)

m = slope = $\frac{\text{Rise}}{\text{Run}} = \frac{-2}{1}$

b = y intercept = -3



$x - y > -4$ → put in $y = mx + b$

$-x \quad -x$

$-y > -x - 4$

$\frac{-y}{-1} > \frac{-x}{-1} - \frac{4}{-1}$

$y < x + 4$

$m = 1$, $B = 4$

← FOR INEQUALITIES, when you multiply or divide the variable by a negative # switch the symbol

→ test (0,0) in orig EQ

$0 - 0 > -4$

$0 > -4$ T

Shade area with (0,0)

Chapter 8 pg 945 #'s 11, 21, 23, 37, 39

Simplify the expression. In exercises involving numerical bases only, write your answer using exponents.

(11) $(3d^2)^3 \cdot 2d^2$

power to power (multiply exponents)

$3^3 \cdot d^6 \cdot 2d^2 = 2 \cdot 3^3 d^8 = 2 \cdot 27 d^8 =$ → $\boxed{54d^8}$

mult - add exponents

(21) $\left(\frac{4y^5}{3}\right)^3 \cdot \frac{1}{y^6}$

$\frac{4^3 y^{15}}{3^3} \cdot \frac{1}{y^6} = \frac{64 y^{15-6}}{27}$ → $\boxed{\frac{64y^9}{27}}$

(23) $\left(\frac{5x^3y^4}{2x^2y}\right)^2 = \left(\frac{5xy^3}{2}\right)^2 = \frac{5^2x^2y^6}{2^2} =$ → $\boxed{\frac{25x^2y^6}{4}}$

simplify inside ( )'s

Simplify the expression. Write your answer using only positive exponents.

(37) $\left(\frac{x^{-4}}{y^{-5}}\right)$ $\boxed{\frac{y^5}{x^4}}$ → $\boxed{\frac{y^5}{x^4}}$

(39) $\frac{3}{(-2z)^{-5}}$

$3 \cdot (-2z)^5 =$

$3 \cdot (-2)^5 z^5 =$

$3(-32) z^5 =$ → $\boxed{-96z^5}$

Rules

$x^0 = 1$

$x^2 \cdot x^3 = x^5$ ADD

$(x^2)^3 = x^6$ MULT

$\frac{x^5}{x^2} = x^3$ SUBTRACT

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

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

Chapter 9 pg 946 #'s 5, 7, 10, 21, 22, 35, 39, 61-65

Find the sum or difference.

(5) $(6b^3+12b^2-b)-(15b^2+7b-8)$ ← Change − to + and take opposite in ( )'s

$6b^3+12b^2-b+-15b^2-7b+8 =$ → $\boxed{6b^3-3b^2-8b+8}$

Find the product.

(7) $5x^4(2x^3-3x^2+5x-1) =$ → $\boxed{10x^7-15x^6+25x^5-5x^4}$

(10) $(2x^2-5x+6)(3x-2) = 6x^3-15x^2+18x$

$-4x^2+10x-12 =$ → $\boxed{6x^3-19x^2+28x-12}$

Solve the equation.

(21) $(5y-3)(2y-4)=0$ ← SET EACH FACTOR TO 0 + SOLVE

$5y-3=0$ → $y=3/5$ $\quad 2y-4=0$ → $y=2$ $\quad \boxed{y=\frac{3}{5},2}$

(22) $3b^2+9b=0$ ← FACTOR

$\Rightarrow 3b(b+3)=0$

$3b=0$ → $b=0$ $\quad b+3=0$ → $b=-3$ $\quad \boxed{b=-3,0}$

(35) $r^2-15r=-8r-10$ ← put in STD FORM $Ax^2+Bx+C=0$

$r^2-7r+10=0$ ← factor

$(r-2)(r-5)=0$ ← Solve by setting each factor $=0$

$r-2=0$ → $r=2$ $\quad r-5=0$ → $r=5$

Factor the trinomial

(39) $4k^2-12k+5 = (2k-5)(2k-1)$

1 15

1 4

2 2

Chapter 9 (cont)

Factor the polynomial completely.

(61) $(3y^3+15y^2)+(2y+10)$ ← 4 TERMS – FACTOR BY GROUPING; FOR EACH GROUP PULL OUT COMMON FACTOR

$3y^2(y+5)+2(y+5)=$

$(3y^2+2)(y+5)$

(62) $30z^3-14z^2-8z$ * STEP 1 ALWAYS PULL OUT COMMON FACTOR

$2z(15z^2-7z-4)$ ← FACTOR

$1 \cdot 15$, $3 \cdot 5$; $1 \cdot 4$, $2 \cdot 2$

$2z(5z-4)(3z+1)$

(63) $98m^3-18m=$

$2m(49m^2-9)=$

$2m(7m-3)(7m+3)$

(64) $8h^2k-32k=$

$8k(h^2-4)=$

$8k(h-2)(h+2)$

(65) $(2h^3-3h^2)(-18h+27)$ must rearrange terms to find a common binomial factor

$(2h^3-18h)+(-3h^2+27)=$

$2h(h^2-9)-3(h^2-9)=$

$(h^2-9)(2h-3)=$

$(h+3)(h-3)(2h-3)$

Chapter 10 pg 947 #'s 9+10, 21-22, 35-36, 39-41

Solve the equation. Round the solutions to nearest hundredth, if necessary.

(21) $2x^2 - 20 = 78$ ← ISOLATE x^2

$2x^2 = 98$

$\sqrt{x^2} = \sqrt{49}$ ← take $\sqrt{}$ of both sides

$x = \pm 7$

(22) $3y^2 + 16 = 4$

$3y^2 = -12$

$\sqrt{y^2} = \sqrt{-4}$ ← Cannot take $\sqrt{}$ of a negative number

$y =$ no solution

page 6a

Use the quadratic formula to solve the equation. Round solutions to the nearest hundredth, if necessary.

(35) $2k^2 - 5k + 2 = 0$

$A = 2 \quad B = -5 \quad C = 2$

$k = \frac{5 \pm \sqrt{25 - 4(2)(2)}}{2(2)} = \frac{5 \pm \sqrt{9}}{4} = \frac{5 \pm 3}{4}$

$k = \frac{5+3}{4}$ ($k = 2$) $\quad k = \frac{5-3}{4}$ ($k = \frac{2}{4}$)

$k = 0.5, 2$

(36) $n^2 = 5n$ – put in $Ax^2 + Bx + C = 0$

$n^2 - 5n + 1 = 0$

$A = 1 \quad B = -5 \quad C = 1$

$n = \frac{5 \pm \sqrt{25 - 4(1)(1)}}{2(1)} = \frac{5 \pm \sqrt{21}}{2}$

$n = 0.21, 4.79$

remember to round at the end

See next page for #'s 9 & 10

Tell whether the equation has two solutions, one solution or no solution. Discriminant = $D = B^2 - 4AC$

(39) $m^2 - 2m + 1 = 0$

$A = 1 \quad B = -2 \quad C = 1$

$D = B^2 - 4AC = 4 - 4(1)(1) = 0$

$D = 0$ → one solution

(40) $3x^2 + 6x + 2 = 0$

$A = 3 \quad B = 6 \quad C = 2$

$D = 36 - 4(3)(2) = 12$

$D = 12$ → two solutions

(41) $2q^2 + 3q + 5 = 0$

$A = 2 \quad B = 3 \quad C = 5$

$D = 9 - 4(2)(5) = -31$

$D = -31$ → no solution

Quadratic Formula $x = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$ ← Discriminant tells # Solutions / X-INTERCEPT.

Chap 10

page 947 #9 +10

(9) $y = x^2 + 4x + 4$

$a=1 \quad b=4 \quad c=4$

FIND A.S.

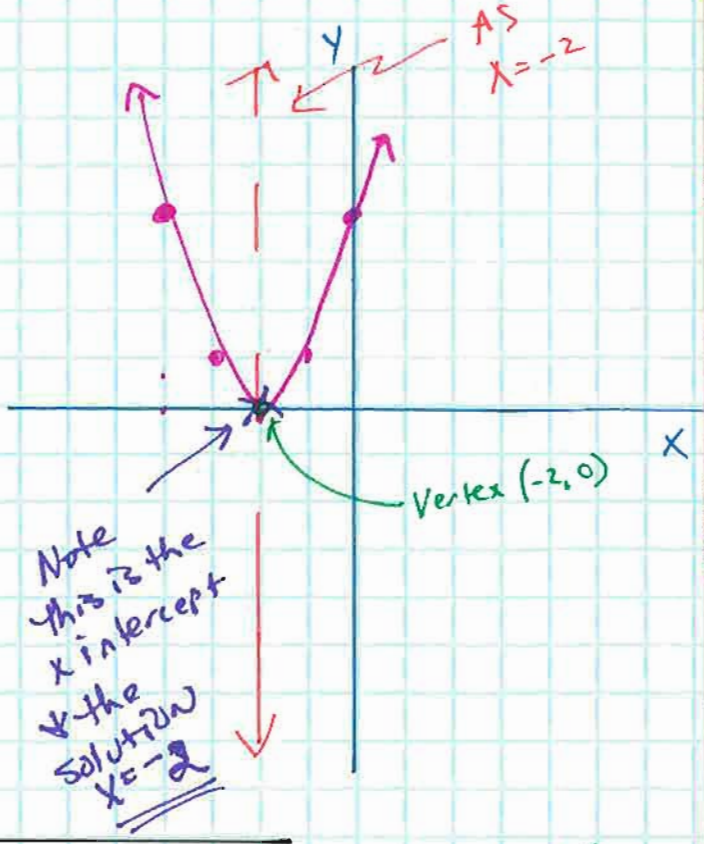
$x = \frac{-B}{2A} = \frac{-4}{2(1)} = -2$ $\boxed{x=-2}$

FIND VERTEX $\boxed{(-2, 0)}$

$y = (-2)^2 + 4(-2) + 4 = 0$

PLOT 5 POINTS

x	-4	-3	-2 (v)	-1	0
y	4	1	0	1	4



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(10) $y = -x^2 - 2x + 3$

$a=-1 \quad b=-2 \quad c=3$

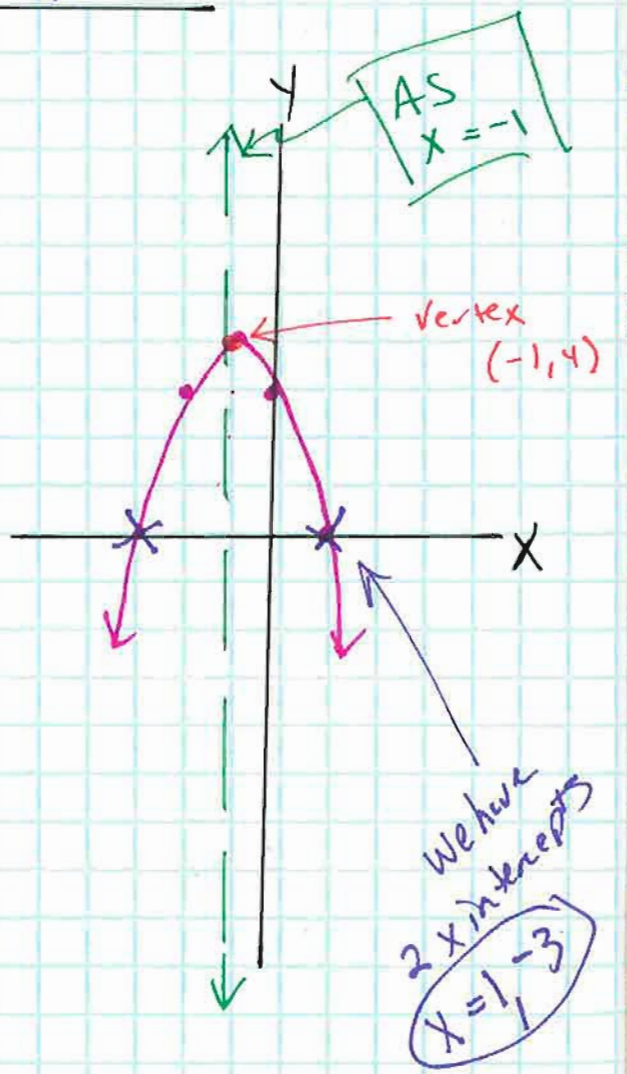
A.S: $x = \frac{-B}{2A} = \frac{2}{2(-1)}$ $\boxed{x=-1}$

VERTEX $(\underset{x}{-1}, \underset{y}{4})$

$y = -(-1)^2 - 2(-1) + 3 = 4$

PLOT 5 POINTS

x	-3	-2	-1 (v)	0	1
y	0	3	4	3	0



Chapter 11 pg 948 #'s 11-29(odd), 34, 37, 40

Simplify the expression.

(11) $\sqrt{300} = \sqrt{100} \cdot \sqrt{3} \longrightarrow \boxed{10\sqrt{3}}$

(13) $\sqrt{17} \cdot \sqrt{17} = \longrightarrow \boxed{17}$

(15) $\sqrt{11g} \cdot 5\sqrt{g} = 5\sqrt{11g^2} = 5\sqrt{g^2}\sqrt{11} \longrightarrow \boxed{5g\sqrt{11}}$

(17) $\sqrt{27x^5} \cdot \sqrt{48x} = \sqrt{1296x^6} = \sqrt{1296} \cdot \sqrt{x^6} \longrightarrow \boxed{36x^3}$

(19) $\sqrt{\frac{1}{6x^2}} = \frac{\sqrt{1}}{\sqrt{6x^2}} = \frac{1}{x\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}} \longrightarrow \boxed{\frac{\sqrt{6}}{6x}}$

(21) $\frac{\sqrt{7}}{\sqrt{8k}} = \frac{\sqrt{7}}{\sqrt{4}\sqrt{2k}} = \frac{\sqrt{7}}{2\sqrt{2k}} \cdot \frac{\sqrt{2k}}{\sqrt{2k}} = \frac{\sqrt{14k}}{2 \cdot 2k} \longrightarrow \boxed{\frac{\sqrt{14k}}{4k}}$

(23) $2\sqrt{3} + \sqrt{7} + \sqrt{3} = \boxed{3\sqrt{3} + \sqrt{7}}$ $\quad \boxed{3\sqrt{3}+\sqrt{7}}$

Combine Like radicals (just like combining like terms)

(25) $\sqrt{45} + 3\sqrt{20}$

$\sqrt{9}\sqrt{5} + 3\sqrt{4}\sqrt{5} = 3\sqrt{5} + 3 \cdot 2\sqrt{5} = \longrightarrow \boxed{9\sqrt{5}}$

(27) $3\sqrt{6}(4\sqrt{6} - \sqrt{600}) = 3 \cdot 4\sqrt{36} - 3\sqrt{3600} =$

$12 \cdot 6 - 3 \cdot 60 = 72 - 180 = \longrightarrow \boxed{-108}$

(29) $(4 - \sqrt{13})(10 + \sqrt{13}) = 40 + 4\sqrt{13} - 10\sqrt{13} - 13 = \longrightarrow \boxed{27 - 6\sqrt{13}}$

Solve the equation. Check for extraneous solutions.

(34) $\left(\sqrt{3x-12}\right)^2 = \left(\sqrt{5x-26}\right)^2$

$3x - 12 = 5x - 26$

$-3x \quad +26 \quad -3x \quad +26$

$14 = 2x$

$x = 7$

$x = 7$

C: $\sqrt{3(7)-12} = \sqrt{5(7)-26}$

$\sqrt{9} = \sqrt{9}$

$3 = 3$ ✓

(37) $(x)^2 = \left(\sqrt{11x-10}\right)^2$

$x^2 = 11x - 10$

$x^2 - 11x + 10 = 0$

$(x-10)(x-1) = 0$

$x = 1, 10$

$x = 1, 10$

C: $x = 1$

$1 = \sqrt{11(1)-10}$

$1 = 1$ ✓

C: $x = 10$

$10 = \sqrt{11(10)-10}$

$10 = \sqrt{100}$

$10 = 10$ ✓

(40) $\left(\sqrt{-4x+5}\right)^2 = (3x)^2$

$-4x + 5 = 9x^2$

$+4x \quad -5 \qquad +4x \quad -5$

$0 = 9x^2 + 4x - 5$

$0 = (9x-5)(x+1)$

$9x - 5 = 0$ $\qquad$ $x + 1 = 0$

$x = 5/9$ $\qquad$ $x = -1$

$x = 5/9$

-1 is an extraneous solution

C: $\sqrt{-4(5/9)+5} = 3(5/9)$

$\sqrt{\frac{25}{9}} = \frac{5}{3}$

$5/3 = 5/3$ ✓

C: $\sqrt{-4(-1)+5} = 3(-1)$

$\sqrt{9} = -3$

$3 \neq -3$

Chapter 12 Final Review HW

Page 949 #'s 19, 20, 25-30, 33-39, 41

(19) $\dfrac{30x^4 - 12x^3 + 6x^2}{-6x} = \boxed{-5x^3 + 2x^2 - x}$

(20)
$$3y - 2 \;\overline{)\; 9y^2 + 3y - 6}$$
$3y + 3$
$-(9y^2 - 6y)$
$9y - 6$
$-(9y - 6)$
0

(25) $\dfrac{44x^3}{24x} = \dfrac{11x^2}{6}$ $\boxed{x \neq 0}$.

(26) $\dfrac{3y+6}{y+2} = \dfrac{3(y+2)}{(y+2)} = 3$ $\boxed{y \neq -2}$

(27) $\dfrac{3a - 15}{4a - 20} = \dfrac{3(a-5)}{4(a-5)} = 3/4$ $a \neq 5$

(28) $\dfrac{2B - 8}{4 - B} = \dfrac{2(B-4)}{-1(B-4)} = -2$ $\boxed{B \neq 4}$

(29) $\dfrac{R^2 - 2R - 15}{R^2 + R - 6} = \dfrac{(R-5)(R+3)}{(R+3)(R-2)} = \dfrac{R-5}{R-2}$ $R \neq -3, 2$

(30) $\dfrac{5+3}{2s^2 + 3s - 9} = \dfrac{(s+3)}{(2s-3)(s+3)} = \boxed{\dfrac{1}{2s-3}}$ $s \neq 3/2, -3$

(33) $\dfrac{x^2 + 3x - 10}{2x - 4} \cdot \dfrac{5x}{x^2 + 2x - 15} = \dfrac{(x+5)(x-2)}{2(x-2)} \cdot \dfrac{5x}{(x+5)(x-3)} = \dfrac{5x}{2(x-3)}$

$\dfrac{5x}{2x-6}$

(34) $\frac{2y^6}{6y^3+8y^2} \cdot (3y+4) = \frac{2y^6}{2y^2(3y+4)} \cdot \frac{(3y+4)}{} = \frac{y^6}{y^2} = \boxed{y^4}$

(35) $\frac{3R^2-12}{R-2} \div \frac{2R^2+7R+6}{2R^2-R-6} = \frac{3(R^2-4)}{(R-2)} \cdot \frac{(2R+3)(R+2)}{(2R+3)(R+2)}$ $\quad (R+2)(R-2)$

$= 3(R-2) = \boxed{3R-6}$

(36) $\frac{3s^2+11s+10}{s+2} \div (-3s^2+s+10) = \frac{(3s+5)(s+2)}{(s+2)} \cdot \frac{1}{-1(3s^2-s-10)}$

$(3s+5)(s-2)$

$\boxed{\frac{-1}{s-2}}$

(37) $\frac{8}{5T}\left(\frac{2T}{2T}\right) + \frac{3}{2T^2}\left(\frac{5}{5}\right) = \frac{16T}{10T^2} + \frac{15}{10T^2} = \boxed{\frac{16T+15}{10T^2}}$

(38) $\frac{3}{u+2}\left(\frac{2u+1}{2u+1}\right) + \frac{4}{2u+1}\left(\frac{u+2}{u+2}\right) = \frac{6u+3+4u+8}{(u+2)(2u+1)} = \boxed{\frac{10u+11}{2u^2+5u+2}}$

(39) $\frac{3}{c^2-9} - \frac{2}{2c^2-3c-9} = \frac{3}{(c+3)(c-3)}\left[\frac{2c+3}{2c+3}\right] + \frac{-2}{(2c+3)(c-3)}\left[\frac{c+3}{c+3}\right]$

$= \frac{6c+9-2c-6}{(c+3)(c-3)(2c+3)} = \boxed{\frac{4c+3}{(c+3)(c-3)(2c+3)}}$

(41) $\frac{2}{x+2} = \frac{x-5}{9}$

$18 = (x+2)(x-5)$

$18 = x^2-3x-10$

$0 = x^2-3x-28$

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

$\boxed{x = 7, -4}$

C: $x=7$ $\quad \frac{2}{9} = \frac{2}{9}$ ✓

C: $x=-4$ $\quad \frac{2}{-2} = \frac{-9}{9}$

$-1 = -1$ ✓