Honors Math II
Unit 8 Day 2 Homework:
Adding and Subtracting Rational Expressions

Name: Key
Date:_____ Period:_____

1. Explain ***how*** to add rational expressions with unlike denominators.

Perform the indicated operation and then simplify.

2. $\frac{9}{x+1}+\frac{-2x}{x+1}$ $\boxed{\frac{9-2x}{x+1}}$

3. $\frac{5x}{x+3}+\frac{15}{x+3} = \frac{5x+15}{x+3} = \frac{5\cancel{(x+3)}}{\cancel{(x+3)}}$

$\boxed{5}$

4. What is the Least Common Multiple of the polynomials $3x^2-9x$ and $6x^2$?

$3x(x-3)$ $6x^2$

A. $3x(x-3)$ B. $6x^2$ C. $6x(x-3)$ D. $6x^2(x-3)$

Perform the indicated operation and then simplify.

5. $\frac{6\cdot 12}{6\cdot 5x}+\frac{7\cdot 5}{6x\cdot 5}$ L.C.D = 30x

$\frac{72+35}{30x} = \boxed{\frac{107}{30x}}$

6. $\frac{3\cdot 8}{3\cdot 3x^2}+\frac{-5\cdot x}{9x\cdot x}$ L.C.D = $9x^2$

$\boxed{\frac{24-5x}{9x^2}}$

7. $\frac{(x+6)}{(x+6)}\frac{3}{x+4}+\frac{-1}{x+6}\frac{(x+4)}{(x+4)}$ L.C.D = $(x+4)(x+6)$

$\frac{3(x+6)-1(x+4)}{(x+4)(x+6)} =$

$\frac{3x+18-x-4}{(x+4)(x+6)} = \boxed{\frac{2x+14}{(x+4)(x+6)}}$

8. $\frac{-15x}{x^2-8x+16}+\frac{12(x-4)}{(x-4)(x-4)}$ L.C.D = $(x-4)^2$

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

$\frac{-15x+12(x-4)}{(x-4)^2} =$

$\frac{-15x+12x-48}{(x-4)^2} = \boxed{\frac{-3x-48}{(x-4)^2}}$

L.C.D $= (x+4)(x-4)$

9. Which expression is equivalent to $\frac{2x}{x+4} + \frac{-x^2+4}{x^2-16}$?

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

A. $\frac{1}{x+4}$ B. $\frac{(x+2)(x-2)}{(x+4)(x-4)}$ C. $\frac{x^2-8x-4}{(x+4)(x-4)}$ D. $\frac{3x^2-8x+4}{(x+4)(x-4)}$

$$\frac{2x^2-8x-x^2-4}{(x+4)(x-4)} = \frac{x^2-8x-4}{(x+4)(x-4)}$$

Perform the indicated operation and then simplify.

10. $\frac{(x+3)\ x}{x^2-9} + \frac{(x+1)(x-3)}{x^2+6x+9}$ L.C.D $= (x+3)^2(x-3)$

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

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

$$\boxed{\frac{2x^2+x-3}{(x+3)^2(x-3)}} \text{ or } \boxed{\frac{(2x+3)(x-1)}{(x+3)^2(x-3)}}$$

11. $\frac{x+2}{x-4} + \frac{2}{x} + \frac{-5x}{3x-1}$ L.C.D $= x(x-4)(3x-1)$

$(x)(3x-1)$ $(x-4)(3x-1)$ $(x)(x-4)$

$$\frac{(x)(3x-1)(x+2)+2(x-4)(3x-1)-5x(x)(x-4)}{x(x-4)(3x-1)}$$

$$\frac{3x^3+5x^2-2x+6x^2-26x+8-5x^3+20x^2}{x(x-4)(3x-1)}$$

$$\boxed{\frac{-2x^3+31x^2-28x+8}{x(x-4)(3x-1)}}$$

12. $\frac{x+3}{x^2-2x-8} + \frac{-x+5}{x^2-12x+32}$ L.C.D. $= (x-4)(x+2)(x-8)$

$(x-4)(x+2)$ $(x-4)(x-8)$

$$\frac{(x+3)(x-8)+(-x+5)(x+2)}{(x-4)(x+2)(x-8)} =$$

$$\frac{x^2-5x-24-x^2+3x+10}{(x-4)(x+2)(x-8)} =$$

$$\boxed{\frac{-2x-14}{(x-4)(x+2)(x-8)}} =$$

13. $\frac{x+3}{x^2-25} + \frac{-x+1}{x-5} + \frac{3}{x+3}$ L.C.D $= (x+5)(x-5)(x+3)$

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

$$\frac{(x+3)(x+3)+(-x+1)(x+5)(x+3)+3(x^2-25)}{(x+5)(x-5)(x+3)}$$

$$\frac{x^2+6x+9+(-x+1)(x^2+8x+15)+3x^2-75}{(x+5)(x-5)(x+3)}$$

$$\frac{x^2+6x+9-x^3-7x^2-7x+15+3x^2-75}{(x+5)(x-5)(x+3)}$$

$$\boxed{\frac{-x^3-3x^2-x-51}{(x+5)(x-5)(x+3)}}$$

Solve.

14. $4(x-2)^2 = 144$

$(x-2)^2 = 36$

$x-2 = \pm\sqrt{36}$

$x = 2 \pm 6$

$x = 8, -4$

15. $6x^2 - 25 = x^2$

$-x^2+25 \quad -x^2+25$

$\frac{5x^2}{5} = \frac{25}{5}$

$x^2 = 5$

$x = \pm\sqrt{5}$

16. $3(x+5)^2 - 10 = 182$

$+10 \quad +10$

$3(x+5)^2 = 192$

$(x+5)^2 = 64$

$x+5 = \pm\sqrt{64}$

$x = -5 \pm 8$

$x = 3, -13$

17. $3x^2 + x = 14$

$3x^2 + x - 14 = 0$

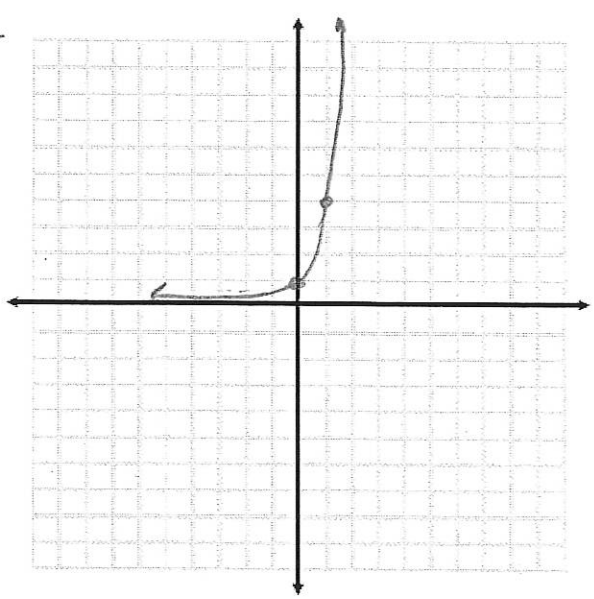
$(3x+7)(x-2) = 0$

$x = -7/3 \quad x = 2$

Graph the function:

18. $y = 4^x$

x	y
0	1
1	4
2	16



19. $y = -3\left(\frac{1}{4}\right)^x$

x	y
0	-3
1	-.75
2	-.1875
-1	-12
-2	-48