Name_____FA Addition and Subtraction that requires factoring Period_____

12	15	20	24	40
(1,12) (2,6) (3,4)	(1,15) (3,5)	(1,20) (2,10) (4,5)	(1,24) (2,12) (3,8) (4,6)	(1,40) (2,20) (4,10) (5,8)

Completely simplify each expression. Show your work in a clear and easy to follow manner

$$\frac{x+4}{x^2-4x-12}+\frac{2x-1}{x^2-18x-40}$$

$$\frac{(x+4)}{(x-6)(x+2)}+\frac{2x-1}{(x-20)(x+2)}$$

GCF $(x+2)$

LCD $(x+2)(x-6)(x-20)$

$$\frac{(x+4)(x-20)}{LCD}+\frac{(2x-1)(x-6)}{LCD}$$

$$\frac{x^2+4x-20x-80}{LCD}+\frac{2x^2-1x-12x+6}{LCD}$$

$$\frac{x^2-16x-80}{LCD}+\frac{2x^2-13x+6}{LCD}$$

$$\boxed{\frac{3x^2-29x-74}{(x-6)(x+2)(x-20)}}$$

6| 3 -29 -74
18 -66
3 -11 | -140

20| 3 -29 -74
60 620
3 31 | 546

-2| 3 -29 -74
-6 70
3 -35 | -4

$$\frac{2x-5}{x^2+11x+24}-\frac{5x-3}{x^2-1x-12}$$

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

GCF $(x+3)$

LCD $(x+3)(x+8)(x-4)$

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

$$\frac{2x^2-5x-8x+20}{LCD}+\frac{-5x^2+3x-40x+}{LCD}$$

$$\frac{2x^2-13x+20}{LCD}+\frac{-5x^2-37x+24}{LCD}$$

$$\boxed{\frac{-3x^2-50x+44}{(x+3)(x+8)(x-4)}}$$

-3| -3 -50 44
9 123
-3 -41 | 167

-8| -3 -50 44
24 208
-3 -26 | 252

4| -3 -50 44
-12 -248
-3 -62 | -204

12	16	20	24	25	40
(1,12) (2,6) (3,4)	(1,16) (2,8) (4,4)	(1,20) (2,10) (4,5)	(1,24) (2,12) (3,8) (4,6)	(1,25) (5,5)	(1,40) (2,20) (4,10) (5,8)

Completely simplify each expression. Show your work in a clear and easy to follow manner

$$\frac{x+5}{x^2-8x+16}+\frac{3x-6}{x^2-10x+24}$$

$$\frac{x+5}{(x-4)(x-4)}+\frac{3x-6}{(x-4)(x-6)}$$

GCF $(x-4)$

LCD $(x-4)(x-4)(x-6)$

$$\frac{(x+5)(x-6)}{LCD}+\frac{3x-6(x-4)}{LCD}$$

$$\frac{x^2+5x-6x-30}{LCD}+\frac{3x^2-6x-12x+24}{LCD}$$

$$\frac{x^2-1x-30}{LCD}+\frac{3x^2-18x+24}{LCD}$$

$$\boxed{\frac{4x^2-19x-6}{(x-4)(x-4)(x-6)}}$$

4) 4 −19 −6

16 −12

4 −3 −18

6) 4 −19 −6

24 30

4 5 24

$$\frac{2x-5}{x^2-3x-40}-\frac{5x-3}{x^2-25}$$

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

GCF $(x+5)$

LCD $(x-8)(x+5)(x-5)$

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

$$\frac{2x^2-5x-10x+25}{LCD}+\frac{-5x^2+3x+40x-24}{LCD}$$

$$\frac{2x^2-15x+25}{LCD}+\frac{-5x^2+43x-24}{LCD}$$

$$\boxed{\frac{-3x^2+28x+1}{(x-8)(x+5)(x-5)}}$$

8) −3 28 1

−24 32

−3 4 33

5) −3 28 1

−15 65

−3 13 66

−5) −3 28 1

15 −215

−3 43 −214

Name_____FA Addition and Subtraction that requires factoring Period_____

12	15	20	24	40
(1,12) (2,6) (3,4)	(1,15) (3,5)	(1,20) (2,10) (4,5)	(1,24) (2,12) (3,8) (4,6)	(1,40) (2,20) (4,10) (5,8)

Completely simplify each expression. Show your work in a clear and easy to follow manner

$$\frac{x+5}{x^2+1x-12}+\frac{2x-5}{x^2-2x-24}$$

$$\frac{x+5}{(x+4)(x-3)}+\frac{2x-5}{(x-6)(x+4)}$$

GCF $(x+4)$

LCD $(x+4)(x-3)(x-6)$

$$\frac{(x+5)(x-6)}{LCD}+\frac{(2x-5)(x-3)}{LCD}$$

$$\frac{x^2+5x-6x-30}{LCD}+\frac{2x^2-5x-6x+15}{LCD}$$

$$\frac{x^2-1x-30}{LCD}+\frac{2x^2-11x+15}{LCD}$$

$$\boxed{\frac{3x^2-12x-15}{(x+4)(x-3)(x-6)}}$$

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

$$\frac{3(x-5)(x+1)}{(x+4)(x-3)(x-6)}$$

$$\frac{x-6}{x^2-6x-40}-\frac{2x-7}{x^2+7x+12}$$

$$\frac{(x-6)}{(x-10)(x+4)}+\frac{-2x+7}{(x+3)(x+4)}$$

GCF $(x+4)$

LCD $(x+4)(x-10)(x+3)$

$$\frac{(x-6)(x+3)}{LCD}+\frac{(-2x+7)(x-10)}{LCD}$$

$$\frac{x^2-6x+3x-18}{LCD}+\frac{-2x^2+7x+20x-70}{LCD}$$

$$\frac{x^2-3x-18}{LCD}+\frac{-2x^2+27x-70}{LCD}$$

$$\boxed{\frac{-1x^2+24x-88}{(x+4)(x-10)(x+3)}=\frac{-1(x^2-24x+88)}{(x+4)(x-10)(x+3)}}$$

$-4\rfloor$ -1 24 -88
4 112
-1 28 $\lfloor 24$

$-3\rfloor$ -1 24 88
3 -81
-1 27 $\lfloor 7$

$10\rfloor$ -1 24 -88
-10 140
-1 14 $\lfloor 52$

9 (1,9) (3,3)	15 (1,15) (3,5)	16 (1,16) (2,8) (4,4)	24 (1,24) (2,12) (3,8) (4,6)	25 (1,25) (5,5)	36 (1,36) (2,18) (3,12) (4,9) (6,6)

Completely simplify each expression. Show your work in a clear and easy to follow manner

$$\frac{x+10}{x^2-12x+36}+\frac{5x-7}{x^2-2x-24}$$

$$\frac{x+10}{(x-6)(x-6)}+\frac{5x-7}{(x-6)(x+4)}$$

GCF $(x-6)$

LCD $(x-6)(x-6)(x+4)$

$$\frac{(x+10)(x+4)}{LCD}+\frac{(5x-7)(x-6)}{LCD}$$

$$\frac{x^2+10x+4x+40}{LCD}+\frac{5x^2-7x-30x+42}{LCD}$$

$$\frac{x^2+14x+40}{LCD}+\frac{5x^2-37x+42}{LCD}$$

$$\boxed{\frac{6x^2-23x+82}{(x-6)(x-6)(x+4)}}$$

6| 6 −23 82
36 78
6 13 |160

−4| 6 −23 82
−36 +354
6 −59 |436

$$\frac{7x-1}{x^2+6x+9}-\frac{4x-3}{(x^2-9)}$$

$$\frac{7x-1}{(x+3)(x+3)}+\frac{-4x+3}{(x+3)(x-3)}$$

GCF $(x+3)$

LCD $(x+3)(x+3)(x-3)$

$$\frac{(7x-1)(x-3)}{LCD}+\frac{(-4x+3)(x+3)}{LCD}$$

$$\frac{7x^2-1x-21x+3}{LCD}+\frac{-4x^2+3x-12x+9}{LCD}$$

$$\frac{7x^2-22x+3}{LCD}+\frac{-4x^2-9x+9}{LCD}$$

$$\boxed{\frac{3x^2-31x+12}{(x-3)(x+3)(x+3)}}$$

3| 3 −31 12
9 −66
3 −22 |−54

−3| 3 −31 12
−9 120
3 −40 |132

Name_____FA Addition and Subtraction that requires factoring Period_____

12	15	20	24	40
(1,12)	(1,15)	(1,20)	(1,24)	(1,40)
(2,6)	(3,5)	(2,10)	(2,12)	(2,20)
(3,4)		(4,5)	(3,8)	(4,10)
			(4,6)	(5,8)

Completely simplify each expression. Show your work in a clear and easy to follow manner

$$\frac{x+7}{x^2-8x-20}+\frac{3x-2}{x^2-10x-24}$$

$$\frac{x+7}{(x-10)(x+2)}+\frac{3x-2}{(x-12)(x+2)}$$

GCF $(x+2)$

LCD $(x+2)(x-10)(x-12)$

$$\frac{(x+7)(x-12)}{LCD}+\frac{(3x-2)(x-10)}{LCD}$$

$$\frac{x^2+7x-12x-84}{LCD}+\frac{3x^2-2x-30x+20}{LCD}$$

$$\frac{x^2-5x-84}{LCD}+\frac{3x^2-32x+20}{LCD}$$

$$\boxed{\frac{4x^2-37x-64}{(x-10)(x-12)(x+2)}}$$

-2| 4 -37 -64 -12| 4 -37 -64

-8 90 -48 -340

4 -45 |26 4 -85 |-404

10| 4 -37 -64

40 30

4 3 |-34

$$\frac{x-6}{x^2-12x+20}-\frac{3x-2}{x^2+18x-40}$$

$$\frac{x-6}{(x-10)(x-2)}+\frac{-3x-2}{(x+20)(x-2)}$$

GCF $(x-2)$

LCD $(x-2)(x-10)(x+20)$

$$\frac{(x-6)(x+20)}{LCD}+\frac{(-3x+2)(x-10)}{LCD}$$

$$\frac{x^2+20x-6x-120}{LCD}+\frac{-3x^2+2x+30x-2}{LCD}$$

$$\frac{x^2+14x-120}{LCD}+\frac{-3x^2+32x-20}{LCD}$$

$$\boxed{\frac{-2x^2+46x-140}{(x-10)(x-2)(x+20)}}$$

10| -2 46 -140 -2| -2 46 -140

-20 260 40 |720

-2 26 |120 -2 86 |580

2| -2 46 -140

-4 84

-2 42 |56

9 (1,9) (3,3)	15 (1,15) (3,5)	20 (1,20) (2,10) (4,5)	24 (1,24) (2,12) (3,8) (4,6)	25 (1,25) (5,5)	40 (1,40) (2,20) (4,10) (5,8)

Completely simplify each expression. Show your work in a clear and easy to follow manner

$$\frac{x+10}{x^2-10x+9}+\frac{5x-3}{x^2+14x-15}$$

$$\frac{x+10}{(x-9)(x-1)}+\frac{5x-3}{(x+15)(x-1)}$$

GCF $(x-1)$

LCD $(x-1)(x-9)(x+15)$

$$\frac{(x+10)(x+15)}{LCD}+\frac{(5x-3)(x-9)}{LCD}$$

$$\frac{x^2+10x+15x+150}{LCD}+\frac{5x^2-3x-45x+27}{LCD}$$

$$\frac{x^2+25x+150}{LCD}+\frac{5x^2-48x+27}{LCD}$$

$$\boxed{\frac{6x^2-23+177}{(x-9)(x-1)(x+15)}}$$

$$\begin{array}{r|rrr} 9 & 6 & -23 & 177 \\ & & 54 & 279 \\ \hline & 6 & 31 & \boxed{456} \end{array}$$

$$\begin{array}{r|rrr} -15 & 6 & -23 & 177 \\ & & -90 & \\ \hline & 6 & -113 & \end{array}$$

$$\begin{array}{r|rrr} 1 & 6 & -23 & 177 \\ & & 6 & -17 \\ \hline & 6 & -17 & \boxed{160} \end{array}$$

$$\frac{5x-1}{x^2+10x+25}-\frac{7x-2}{x^2-25}$$

$$\frac{5x-1}{(x+5)(x+5)}+\frac{-7x+2}{(x-5)(x+5)}$$

GCF $(x+5)$

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

$$\frac{(5x-1)(x-5)}{LCD}+\frac{(-7x+2)(x+5)}{LCD}$$

$$\frac{5x^2-1x-25x+5}{LCD}+\frac{-7x^2+2x-35x+10}{LCD}$$

$$\frac{5x^2-26x+5}{LCD}+\frac{-7x^2-33x+10}{LCD}$$

$$\boxed{\frac{-2x^2-59x+15}{(x+5)(x-5)(x+5)}}$$

$$\begin{array}{r|rrr} -5 & -2 & -59 & 15 \\ & & 10 & 245 \\ \hline & -2 & -49 & \boxed{260} \end{array}$$

$$\begin{array}{r|rrr} 5 & -2 & -59 & 15 \\ & & -10 & -345 \\ \hline & -2 & -69 & \boxed{-330} \end{array}$$

Name_____FA Addition and Subtraction that requires factoring Period_____

12	15	20	24	40
(1,12) (2,6) (3,4)	(1,15) (3,5)	(1,20) (2,10) (4,5)	(1,24) (2,12) (3,8) (4,6)	(1,40) (2,20) (4,10) (5,8)

Completely simplify each expression. Show your work in a clear and easy to follow manner

$$\frac{x+5}{x^2+4x-12}+\frac{2x-3}{x^2+10x-24}$$

$$\frac{x+5}{(x+6)(x-2)}+\frac{2x-3}{(x+12)(x-2)}$$

GCF $(x-2)$

LCD $(x-2)(x+12)(x+6)$

$$\frac{(x+5)(x+12)}{LCD}+\frac{(2x-3)(x+6)}{LCD}$$

$$\frac{x^2+5x+12x+60}{LCD}+\frac{2x^2-3x+12x-18}{LCD}$$

$$\frac{x^2+17x+60}{LCD}+\frac{2x^2+9x-18}{LCD}$$

$$\boxed{\frac{3x^2+26x+42}{(x+6)(x-2)(x+12)}}$$

-6| 3 26 42
-18 -48
3 8 |-6

-12| 3 26 42
-36 120
3 -10 |162

2| 3 26 42
6 64
3 32 |106

$$\frac{x-6}{x^2-2x-15}-\frac{3x-2}{x^2+3x-40}$$

$$\frac{x-6}{(x-5)(x+3)}+\frac{-3x+2}{(x+8)(x-5)}$$

GCF $(x-5)$

LCD $(x-5)(x+3)(x+8)$

$$\frac{(x-6)(x+8)}{LCD}+\frac{(-3x+2)(x+3)}{LCD}$$

$$\frac{x^2-6x+8x-48}{LCD}+\frac{-3x^2+2x-9x+6}{LCD}$$

$$\frac{x^2+2x-48}{LCD}+\frac{-3x^2-7x+6}{LCD}$$

$$\boxed{\frac{-2x^2-5x-42}{(x-5)(x+3)(x+8)}}$$

5| -2 -5 -42
-10 -75
-2 -15 |-117

-8| -2 -5 -42
16 -88
-2 11 |13

-3| -2 -5 -42
6 -3
-2 1 |-45

12 (1,12) (2,6) (3,4)	16 (1,16) (2,8) (4,4)	20 (1,20) (2,10) (4,5)	24 (1,24) (2,12) (3,8) (4,6)	25 (1,25) (5,5)	40 (1,40) (2,20) (4,10) (5,8)

Completely simplify each expression. Show your work in a clear and easy to follow manner

$$\frac{x+7}{x^2-10x+25}+\frac{5x-2}{x^2-9x+20}$$

$$\frac{x+7}{(x-5)(x-5)}+\frac{5x-2}{(x-4)(x-5)}$$

GCF $=(x-5)$

LCD $(x-5)(x-5)(x-4)$

$$\frac{(x+7)(x-4)}{LCD}+\frac{(5x-2)(x-5)}{LCD}$$

$$\frac{x^2+7x-4x-28}{LCD}+\frac{5x^2-2x-25x+10}{LCD}$$

$$\frac{x^2+3x-28}{LCD}+\frac{5x^2-27x+10}{LCD}$$

$$\boxed{\frac{6x^2-24x-18}{(x-5)(x-5)(x-4)}}$$

not factorable

$$\frac{6(x^2-4x-3)}{(x-5)(x-5)(x-4)}$$

5| 1 -4 -3
5 5
1 1 |2

4| 1 -4 -3
4 0
1 0 |-3

$$\frac{2x-5}{x^2-6x-40}-\frac{5x-3}{x^2-16}$$

$$\frac{2x-5}{(x-10)(x+4)}+\frac{-5x-3}{(x-4)(x+4)}$$

GCF $=(x+4)$

LCD $(x+4)(x-4)(x-10)$

$$\frac{(2x-5)(x-4)}{LCD}+\frac{(-5x+3)(x-10)}{LCD}$$

$$\frac{2x^2-5x-8x+20}{LCD}+\frac{-5x^2+3x+50x-}{LCD}$$

$$\frac{2x^2-13x+20}{LCD}+\frac{-5x^2+53x-30}{LCD}$$

$$\boxed{\frac{-3x^2+40x-10}{(x-4)(x+4)(x-10)}}$$

4| -3 40 -10
-12 112
-3 28 |102

10| -3 40 -10
-30 100
-3 10 |90

-4| -3 40 -10
12 -208
-3 52 |-218