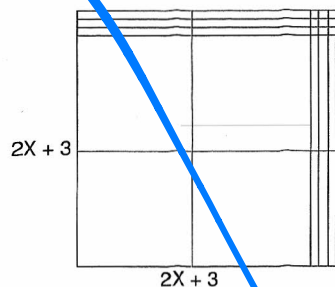
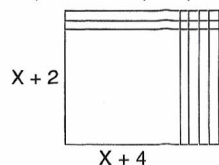


22E

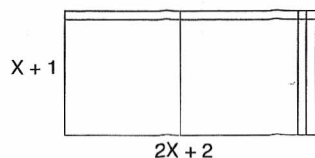
1)  $(2X+3)(2X+3)$



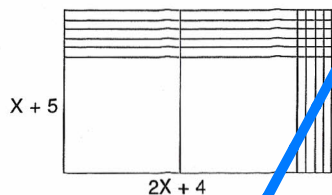
2)  $2(X^2 + 6X + 8) = 2(X+4)(X+2)$



3)  $2X^2 + 4X + 2$



4)  $2X^2 + 14X + 20$



5)  $(4X+3)(X+2)$

6) 
$$\begin{array}{r} 4X+3 \\ \times X+2 \\ \hline 8X+6 \\ 4X^2+3X \\ \hline 4X^2+11X+6 \end{array}$$

7)  $(2X+1)(X+5)$

8) 
$$\begin{array}{r} 2X+1 \\ \times X+5 \\ \hline 10X+5 \\ 2X^2+X \\ \hline 2X^2+11X+5 \end{array}$$

9)  $(X+3)(X+1)$

10) 
$$\begin{array}{r} X+3 \\ \times X+1 \\ \hline X+3 \\ X^2+3X \\ \hline X^2+4X+3 \end{array}$$

11)  $B^2+6\cdot5C^2\cdot5 = B^3C^3$

12)  $Y^5+A$

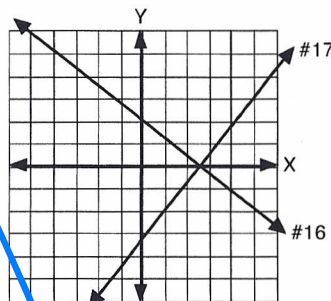
13)  $D^5C^3A^2A^0D^7C^2 = A^2C^5D^{15}$

14)  $A^5D^6A^7C^3D^8 = A^2C^3D^2$

15) 
$$\begin{array}{l} 3 \times 100,000 + 5 \times 1 + 2 \times 1/100 \\ + 8 \times 1/1000 = \\ 300,005.028 \end{array}$$

16)  $Y = -4/5 X + 2$   
see graph

17)  $m = 5/4$   
 $(-2) = 5/4(1) + b$   
 $b = -13/4$   
 $Y = 5/4 X - 13/4$  or  $5X - 4Y = 13$   
see graph



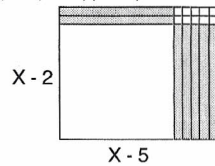
| day | grams |
|-----|-------|
| 1   | 5     |
| 2   | 25    |
| 3   | 125   |
| 4   | 625   |

| day | grams          |
|-----|----------------|
| 1   | 5 <sup>1</sup> |
| 2   | 5 <sup>2</sup> |
| 3   | 5 <sup>3</sup> |
| 4   | 5 <sup>4</sup> |

20) 8 days = 5<sup>8</sup>  
Y days = 5<sup>Y</sup>

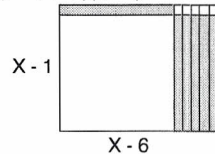
23A

1)  $(X-5)(X-2)$



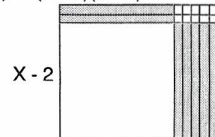
$$\begin{array}{r} X-5 \\ \times X-2 \\ \hline -2X+10 \\ X^2-5X \\ \hline X^2-7X+10 \end{array}$$

2)  $(X-6)(X-1)$



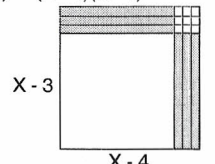
$$\begin{array}{r} X-6 \\ \times X-1 \\ \hline -X+6 \\ X^2-6X \\ \hline X^2-7X+6 \end{array}$$

3)  $(X-7)(X-2)$



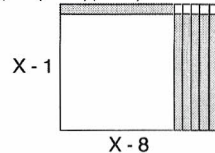
$$\begin{array}{r} X-7 \\ \times X-2 \\ \hline -2X+14 \\ X^2-7X \\ \hline X^2-9X+14 \end{array}$$

4)  $(X-4)(X-3)$



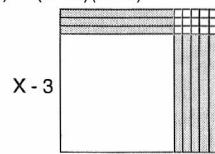
$$\begin{array}{r} X-4 \\ \times X-3 \\ \hline -3X+12 \\ X^2-4X \\ \hline X^2-7X+12 \end{array}$$

5)  $(X-8)(X-1)$



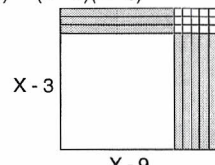
$$\begin{array}{r} X-8 \\ \times X-1 \\ \hline -X+8 \\ X^2-8X \\ \hline X^2-9X+8 \end{array}$$

6)  $(X-7)(X-3)$



$$\begin{array}{r} X-7 \\ \times X-3 \\ \hline -3X+21 \\ X^2-7X \\ \hline X^2-10X+21 \end{array}$$

7)  $(X-9)(X-3)$



$$\begin{array}{r} X-9 \\ \times X-3 \\ \hline -5X+27 \\ X^2-9X \\ \hline X^2-12X+27 \end{array}$$

8)  $(X-5)(X-6)$

$$\begin{array}{r} X-5 \\ \times X-6 \\ \hline -6X+30 \\ X^2-5X \\ \hline X^2-11X+30 \end{array}$$

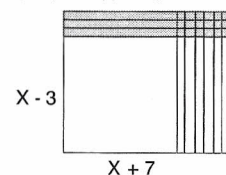
9)  $(X-9)(X-10)$

$$\begin{array}{r} X-9 \\ \times X-10 \\ \hline -10X+90 \\ X^2-9X \\ \hline X^2-19X+90 \end{array}$$

10)  $(X-11)(X-3)$

$$\begin{array}{r} X-11 \\ \times X-3 \\ \hline -3X+33 \\ X^2-11X \\ \hline X^2-14X+33 \end{array}$$

11)  $(X+7)(X-3)$



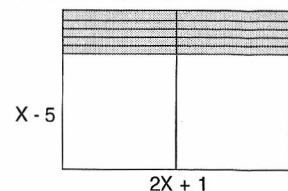
$$\begin{array}{r} X+7 \\ \times X-3 \\ \hline -3X-21 \\ X^2+7X \\ \hline X^2+4X-21 \end{array}$$

12)  $(X+7)(X-5)$  Continue to check by multiplying.

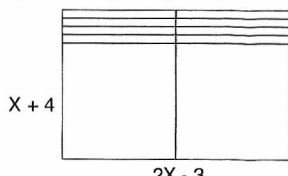
13)  $(X+6)(X-3)$

14)  $(X-9)(X+4)$

15)  $(2X+1)(X-5)$



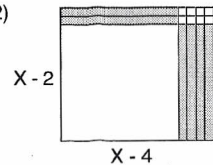
16)  $(2X-3)(X+4)$



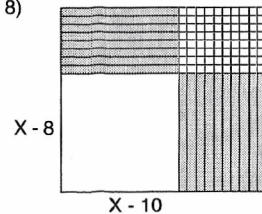
23B

Continue to check by multiplying.

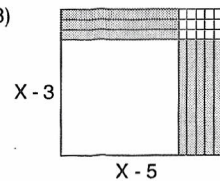
1)  $(X - 4)(X - 2)$



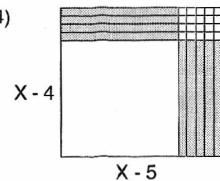
2)  $(X - 10)(X - 8)$



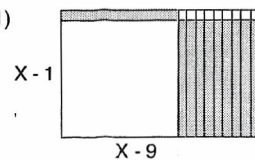
3)  $(X - 5)(X - 3)$



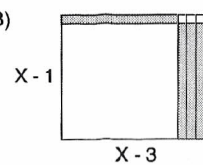
4)  $(X - 5)(X - 4)$



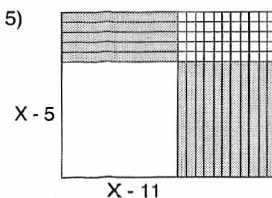
5)  $(X - 9)(X - 1)$



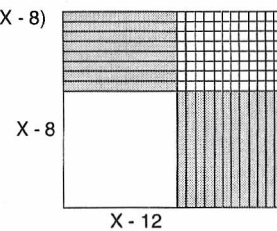
6)  $(X - 1)(X - 3)$



7)  $(X - 11)(X - 5)$



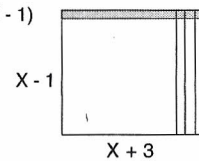
8)  $(X - 12)(X - 8)$



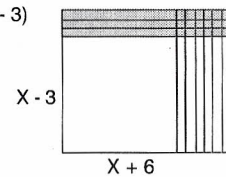
9)  $(X - 7)(X - 6)$

10)  $(X - 8)(X - 3)$

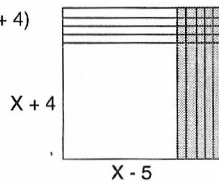
11)  $(X + 3)(X - 1)$



12)  $(X + 6)(X - 3)$



13)  $(X - 5)(X + 4)$



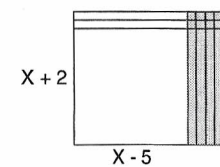
14)  $(X + 5)(X - 3)$

15)  $(5X - 1)(X + 2)$

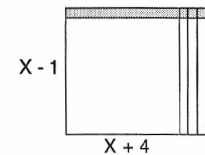
16)  $(4X - 1)(X + 2)$

23C

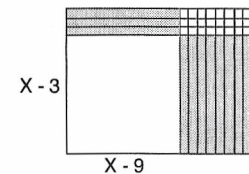
1)  $(X - 5)(X + 2)$



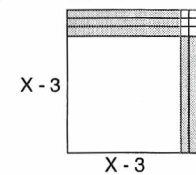
2)  $(X + 4)(X - 1)$



3)  $X^2 - 12X + 27$



4)  $X^2 - 6X + 9$



5)  $(X + 2)(X - 1)$

$$\begin{array}{r} X + 2 \\ \times \quad X - 1 \\ \hline -X - 2 \\ X^2 + 2X \\ \hline X^2 + X - 2 \end{array}$$

7)  $(X + 5)(X - 2)$

$$\begin{array}{r} X + 5 \\ \times \quad X - 2 \\ \hline -2X - 10 \\ X^2 + 5X \\ \hline X^2 + 3X - 10 \end{array}$$

9)  $(2X + 1)(X + 3)$

$$\begin{array}{r} 2X + 1 \\ \times \quad X + 3 \\ \hline 6X + 3 \\ 2X^2 + X \\ \hline 2X^2 + 7X + 3 \end{array}$$

11)  $3^4 \cdot 2 \cdot 3 = 3^{-1}$

12)  $7^{-15}$

13)  $A^5 B^2 A^{-4} A^{-3} B^{-7} = A^{-2} B^{-5}$

14)  $2AB^{-2} + 4B^{-1}B^1A^1 + 3A^2B^{-2}A^{-1}$

$2AB^{-2} + 4B^0A^1 + 3A^1B^{-2}$

$2AB^{-2} + 4A + 3AB^{-2}$

$5AB^{-2} + 4A$

$$\begin{array}{l} 15) \quad 3(-4X) = 2X + 7 \\ \quad \quad -12X = 2X + 7 \\ \quad \quad \quad X = -1/2 \end{array} \quad \begin{array}{l} Y = -4(-1/2) \\ Y = 2 \end{array}$$

$(-1/2, 2)$

$$\begin{array}{l} 16) \quad 7(N + 2) + 2N - 6(N + 4) = -1 \\ \quad \quad 7N + 14 + 2N - 6N - 24 = -1 \\ \quad \quad 3N - 10 = -1 \\ \quad \quad N = 3 \end{array} \quad \begin{array}{l} 3, 5, 7 \end{array}$$

17)  $.10D + .05N = .95, \quad D + N = 12$

$$\begin{array}{r} 10D + 5N = 95 \\ -5D - 5N = -60 \\ \hline 5D = 35 \\ D = 7 \end{array} \quad \begin{array}{l} (7) + N = 12 \\ N = 5 \end{array}$$

18)  $\frac{2}{3} \div \frac{5}{6} \times \frac{1}{2} =$

$$\frac{2}{3} \times \frac{6}{5} \times \frac{1}{2} = \frac{2}{5}$$

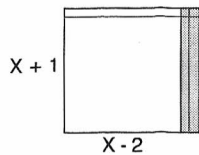
19)  $20X - 2X + 140 = 209$

$$\begin{array}{l} 18X = 69 \\ X = 69/18 = 3 \frac{5}{6} \end{array}$$

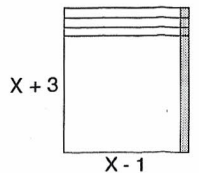
$$\begin{array}{l} 20) \quad 5.5\% = .055 \\ \quad \quad .055 \times 400 = 22 \end{array}$$

23D

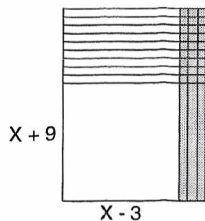
1)  $(X-2)(X+1)$



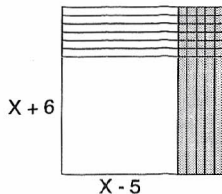
2)  $(X-1)(X+3)$



3)  $X^2 + 6X - 27$



4)  $X^2 + X - 30$



5)  $(X-4)(X+1)$

6) 
$$\begin{array}{r} X-4 \\ \times X+1 \\ \hline X^2-4X \\ X^2-3X-4 \end{array}$$

7)  $(X-3)(X+1)$

8) 
$$\begin{array}{r} X-3 \\ \times X+1 \\ \hline X^2-3X \\ X^2-2X-3 \end{array}$$

9)  $(X-3)(X+2)$

10) 
$$\begin{array}{r} X-3 \\ \times X+2 \\ \hline 2X-6 \\ X^2-3X \\ X^2-X-6 \end{array}$$

11)  $10^{2 \times 7} = 10^{14}$

12)  $5^{2 \times 4 \times 3} = 5^{24}$

13)  $D^{-4+3-2+4+5} = D^{-2}$

14)  $B^3 + 3B^3 + 5B^5 = 4B^3 + 5B^5$

15) 
$$\begin{array}{l} 2(-4X+5) = 4X-3 \\ -8X+10 = 4X-3 \\ 13 = 12X \\ X = 13/12 \end{array} \quad \begin{array}{l} Y = -4(13/12) + 5 \\ Y = 2/3 \\ (13/12, 2/3) \end{array}$$

16) 
$$\begin{array}{l} 4(N+1) + 3(N+2) - 8N + 11 = 0 \\ 4N + 4 + 3N + 6 - 8N + 11 = 0 \\ N = 21 \quad 21, 22, 23 \end{array}$$

17) 
$$\begin{array}{r} .10D + .05N = 3.30 \\ 10D + 5N = 330 \\ -5D - 5N = -225 \\ \hline 5D = 105 \\ D = 21 \end{array} \quad \begin{array}{l} D + N = 45 \\ (21) + N = 45 \\ N = 24 \end{array}$$

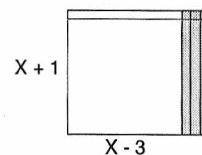
18) 
$$\frac{1}{2} \div \frac{1}{2} \times \frac{3}{4} = \frac{1}{2} \times \frac{2}{1} \times \frac{3}{4} = \frac{3}{4}$$

19) 
$$\begin{array}{l} 103X + 20X - 73X = 45 \\ 50X = 45 \\ X = 9/10 \text{ or } .9 \end{array}$$

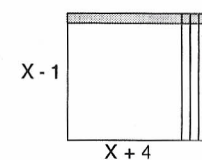
20) 
$$\begin{array}{l} 5.4\% = .054 \\ .054 \times 250 = 13.5 \end{array}$$

23E

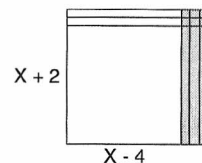
1)  $(X-3)(X+1)$



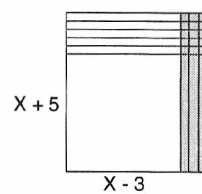
2)  $(X+4)(X-1)$



3)  $X^2 - 2X - 8$



4)  $X^2 + 2X - 15$



5)  $(X-5)(X-2)$

6) 
$$\begin{array}{r} X-5 \\ \times X-2 \\ \hline -2X+10 \\ X^2-5X \\ X^2-7X+10 \end{array}$$

7)  $(3X-7)(X-1)$

8) 
$$\begin{array}{r} 3X-7 \\ \times X-1 \\ \hline -3X+7 \\ 3X^2-7X \\ 3X^2-10X+7 \end{array}$$

9)  $3(X^2 + 5X - 6) = 3(X+6)(X-1)$

10) 
$$\begin{array}{r} X+6 \\ \times X-1 \\ \hline 2X-6 \\ X^2+6X \\ X^2+5X-6 \end{array}$$

11)  $5^{4-6-2} = 5^{-4}$

12)  $6^1$  or 6

13)  $4Q^{-1}Y^{-2} + 5Q^2Y^{-1}$

14)  $5M^3N^2 + 2M^3N^4$

15) 
$$\begin{array}{r} X-Y = -2 \\ 3X+Y = 18 \\ \hline 4X = 16 \\ X = 4 \end{array} \quad \begin{array}{l} 4-Y = -2 \\ Y = 6 \\ (4, 6) \end{array}$$

16) 
$$\begin{array}{l} 11(N) + 2(N+2) = 6(N+4) + 1 \\ 11N + 2N + 4 = 6N + 24 + 1 \\ N = 3 \quad 3, 5, 7 \end{array}$$

17) 
$$\begin{array}{r} .25Q + .10D = 2.00 \\ 25Q + 10D = 200 \\ -25Q - 25D = -350 \\ \hline -15D = -150 \\ D = 10 \end{array} \quad \begin{array}{l} Q + D = 14 \\ Q + (10) = 14 \\ Q = 4 \end{array}$$

18) 
$$\frac{3}{7} \times \frac{14}{15} \div \frac{1}{2} = \frac{3}{7} \times \frac{2}{15} \times \frac{2}{1} = \frac{4}{5}$$

19) 
$$\begin{array}{l} 36 - 8F = 20F + 12 \\ 24 = 28F \\ F = 6/7 \end{array}$$

20) 
$$\begin{array}{l} 6.8\% = .068 \\ .068 \times 95 = 6.46 \end{array}$$

4C

- 1)  $4(A + B + 3) = 4A + 4B + 12$
- 2)  $5(X - Y + Z) = 5X - 5Y + 5Z$
- 3)  $3(2Q - 4 + 3T + 7) = 6Q - 12 + 9T + 21$
- 4)  $2(2X + 3Y - 5) = 4X + 6Y - 10$
- 5)  $15Y + 30X = 10, \quad 5(3Y + 6X) = 5(2)$
- 6)  $12Q + 6Y = 15, \quad 3(4Q + 2Y) = 3(5)$
- 7)  $24C + 18Y = 30, \quad 6(4Q + 3Y) = 6(5)$
- 8)  $36A - 14B = 10, \quad 2(18A - 7B) = 2(5)$
- 9)  $3 - 9 < 4 + 12$   
 $-6 < 16$   
 $-6 < 16$
- 10)  $4X - 16 = 24, \quad 4(X - 4) = 4(6)$   
 $X - 4 = 6, \quad X = 10$
- 11)  $30 - 42Y = 18, \quad 6(5 - 7Y) = 6(3)$   
 $5 - 7Y = 3, \quad Y = 2/7$
- 12)  $-24 + 56 = 16Q, \quad 8(-3 + 7) = 8(2Q)$   
 $4 = 2Q, \quad Q = 2$
- 13)  $-36 = 72A + 45, \quad 9(-4) = 9(8A + 5)$   
 $-4 = 8A + 5, \quad A = -1 1/8$
- 14) LCM = 100
- 15)  $100(.2X) - 100(.03) = 100(.97)$   
 $20X - 3 = 97$   
 $20X = 100, \quad X = 5$
- 16)  $3, 4 = 2 \times 2, 6 = 2 \times 3, \text{ so LCM} = 2 \times 2 \times 3 = 12$
- 17)  $(12) \frac{3}{4} + (12) \frac{1}{8} Q = (12) \frac{5}{8}$   
 $9 + 4Q = 10, \quad Q = 1/4$
- 18) LCM = 100
- 19)  $100(-.7A) + 100(.8A) = 100(.12)$   
 $-70A + 80A = 12$   
 $10A = 12, \quad A = 1.2 \text{ or } 1 1/5$

$$20) \begin{array}{r} 18.9 \\ 4 \overline{) 75.6} \\ \underline{4} \phantom{00} \\ 35 \phantom{00} \\ \underline{32} \phantom{00} \\ 36 \phantom{00} \\ \underline{36} \phantom{00} \\ 0 \end{array}$$

4D

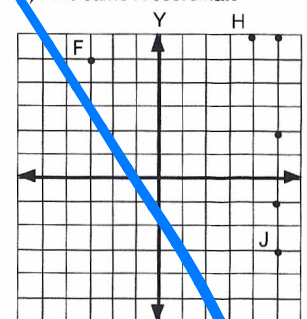
- 1)  $3(A - B - 2) = 3A - 3B - 6$
- 2)  $5(3A - 9 + 2A) = 15A - 45 + 10A$
- 3)  $Q(X + 3) = QX + Q3, \text{ or } QX + 3Q$
- 4)  $-(-A - B + 2C) = A + B - 2C$
- 5)  $10X - 25Y = 40, \quad 5(2X - 5Y) = 5(8)$
- 6)  $24A + 12B = 36, \quad 12(2A + B) = 12(3)$
- 7)  $-14Q - 21D = -42, \quad -7(2Q + 3D) = -7(6)$
- 8)  $3X + 4XY = 7X, \quad X(3 + 4Y) = X(7)$
- 9)  $22X + 33 = 44, \quad 11(2X + 3) = 11(4)$   
 $2X + 3 = 4, \quad X = 1/2$
- 10)  $7Q - 15 = 9 - 5Q, \quad 7Q + 5Q = 9 + 15$   
 $12Q = 24, \quad Q = 2$
- 11)  $30Y - 10 = 10, \quad 10(3Y - 1) = 10(1)$   
 $3Y - 1 = 1, \quad 3Y = 2, \quad Y = 2/3$
- 12)  $56B - 49 = 28, \quad 7(8B - 7) = 7(4)$   
 $8B - 7 = 4, \quad 8B = 11, \quad B = 1 3/8$
- 13) LCM = 100
- 14)  $100(.3X) - 100(1.2) = 100(.34)$   
 $30X - 120 = 34$   
 $30X = 154, \quad X = 5.1\bar{3} \text{ or } 5 2/15$
- 15)  $4 = 2 \times 2, 6 = 2 \times 3, 10 = 2 \times 5$   
 $\text{so LCM} = 2 \times 2 \times 3 \times 5 = 60$
- 16)  $(60) - \frac{3}{4} + (60) \frac{1}{8} R = (60) \frac{7}{10}$   
 $-45 + 10R = 42, \quad 10R = 87$   
 $R = 8.7 \text{ or } 8 7/10$
- 17)  $\begin{array}{r} 75. \text{ gum balls} \\ 0.5 \overline{) 3.75} \\ \underline{35} \phantom{00} \\ 25 \phantom{00} \\ \underline{25} \phantom{00} \\ 0 \end{array}$
- 18)  $\frac{1}{4} = \frac{25}{100} = .25 = 25\%$
- 19)  $40\% = \frac{40}{100} = \frac{2}{5}$
- 20)  $125\% = \frac{125}{100} = 1 \frac{1}{4}$

4E

- 1)  $-2(Q + 2R - 3E) = -2Q - 4R + 6E$
- 2)  $A^2(3 - B) = 3A^2 - A^2B$
- 3)  $-X(Y + 2 - M) = -XY - 2X + MX$
- 4)  $-4(A^2 + B^2 + C^2) = -4A^2 - 4B^2 - 4C^2$
- 5)  $4A - 16B = -18, \quad 2(2A - 8B) = 2(-9)$
- 6)  $20A - 40D = 100, \quad 20(A - 2D) = 20(5)$
- 7)  $6Q + 12G = 3, \quad 3(2Q + 4G) = 3(1)$
- 8)  $-5R - 15T = -20, \quad -5(R + 3T) = -5(4)$
- 9)  $\frac{5}{6} \times \frac{4}{1} \div \frac{5}{2} =$   
 $\frac{5}{6} \times \frac{4}{1} \times \frac{2}{5} = \frac{4}{3} = 1 \frac{1}{3}$
- 10)  $-8 = -10C - 14, \quad -2(4) = -2(5C + 7)$   
 $4 = 5C + 7, \quad -3 = 5C, \quad -3/5 = C$
- 11)  $15 = -45M - 30, \quad 15(1) = 15(-3M - 2)$   
 $1 = -3M - 2, \quad 3 = -3M, \quad -1 = M$
- 12)  $40 + 64 = 48N, \quad 8(5 + 8) = 8(6N)$   
 $13 = 6N, \quad 2 1/6 = N$
- 13)  $63 = 35 - 7P = 7(9) = 7(5 - P)$   
 $9 = 5 - P, \quad -4 = P$
- 14) LCM = 1000
- 15)  $1000(.5Y) - 1000(.3) = 1000(.002)$   
 $500Y - 300 = 2$   
 $500Y = 302, \quad Y = .604 \text{ or } 151/250$
- 16)  $3 = 3, 4 = 2 \times 2, 12 = 2 \times 2 \times 3,$   
 $\text{so LCM} = 2 \times 2 \times 3 = 12$
- 17)  $(12) \frac{11}{3} + (12) \frac{5}{12} K = (12) \frac{5}{4}$   
 $44 + 5K = 15, \quad 5K = -59, \quad K = -11 4/5$
- 18)  $\frac{3}{4} \times \frac{75}{100} = .75 = 75\%$
- 19)  $20\% = \frac{20}{100} = \frac{1}{5}$
- 20)  $380\% = \frac{380}{100} = 3 \frac{4}{5}$

5A

- 1)  $(-2, 3)$
- 2) 2
- 3)  $(-4, -2)$
- 4) 3
- 5)  $(2, -2)$
- 6) 4
- 7)  $(2, 3)$
- 8) 1
- 9)  $(-1, -5)$
- 10) 3
- 11) on graph
- 12) 2
- 13) on graph
- 14) 1
- 15) on graph
- 16) 4
- 17) geometrically
- 18) positive, negative
- 19) the same X coordinate



- 20) X, 5
- 21)
- 22)
- 23)
- 24)