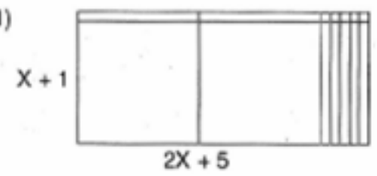
1)

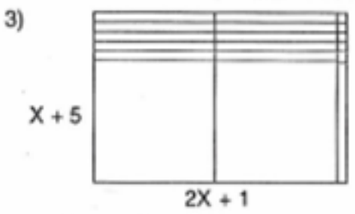


$$\begin{array}{r} 2X+5 \\ \times\ X+1 \\ \hline 2X+5 \\ 2X^2+5X \\ \hline 2X^2+7X+5 \end{array}$$

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

$$\begin{array}{r} 5X+2 \\ \times\ X+3 \\ \hline 15X+6 \\ 5X^2+2X \\ \hline 5X^2+17X+6 \end{array}$$

3)

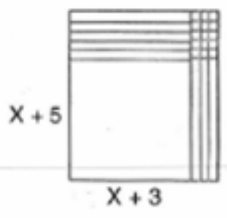


$$\begin{array}{r} 2X+1 \\ \times\ X+5 \\ \hline 10X+5 \\ 2X^2+X \\ \hline 2X^2+11X+5 \end{array}$$

4) $(4X + 1)(X + 3)$

$$\begin{array}{r} 4X+1 \\ \times\ X+3 \\ \hline 12X+3 \\ 4X^2+X \\ \hline 4X^2+13X+3 \end{array}$$

5) $2(X^2 + 8X + 15) = 2(X + 3)(X + 5)$

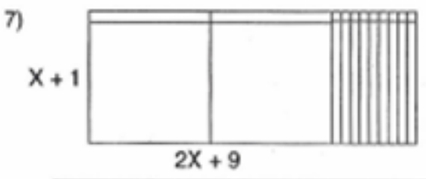


$$\begin{array}{r} X+5 \\ \times\ X+3 \\ \hline 3X+15 \\ X^2+5X \\ \hline X^2+8X+15 \end{array}$$

6) $3(X^2 + 3X + 2) = 3(X + 1)(X + 2)$

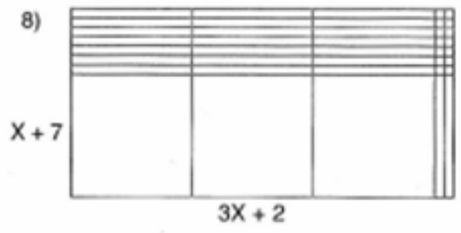
$$\begin{array}{r} X+1 \\ \times\ X+2 \\ \hline 2X+2 \\ X^2+X \\ \hline X^2+3X+2 \end{array}$$

7)



$$\begin{array}{r} 2X+9 \\ \times\ X+1 \\ \hline 2X+9 \\ 2X^2+9X \\ \hline 2X^2+11X+9 \end{array}$$

8)



$$\begin{array}{r} 3X+2 \\ \times\ X+7 \\ \hline 21X+14 \\ 3X^2+2X \\ \hline 3X^2+23X+14 \end{array}$$

9) $(2X + 3)(X + 5)$
The student should continue to build the problems as illustrated at left.

$$\begin{array}{r} 2X+3 \\ \times\ X+5 \\ \hline 10X+15 \\ 2X^2+3X \\ \hline 2X^2+13X+15 \end{array}$$

10) $5(X + 7)(X + 3)$

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

11) $6(X + 4)(X + 2)$

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

12) $(3X + 8)(X + 2)$

$$\begin{array}{r} 3X+8 \\ \times\ X+2 \\ \hline 6X+16 \\ 3X^2+8X \\ \hline 3X^2+14X+16 \end{array}$$

13) $2(2X + 1)(X + 3)$

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

14) $(5X + 2)(X + 1)$

$$\begin{array}{r} 5X+2 \\ \times\ X+1 \\ \hline 5X+2 \\ 5X^2+2X \\ \hline 5X^2+7X+2 \end{array}$$

15) $(10X + 1)(X + 1)$

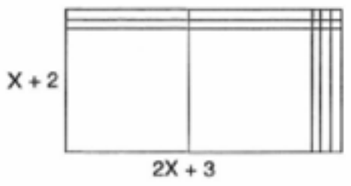
$$\begin{array}{r} 10X+1 \\ \times\ X+1 \\ \hline 10X+1 \\ 10X^2+X \\ \hline 10X^2+11X+1 \end{array}$$

16) $(4X + 3)(X + 5)$
(Check as above)

22C

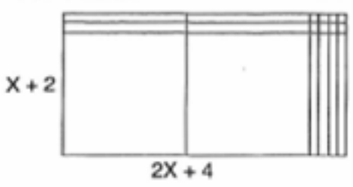
1) $(3X + 4)(X + 1)$

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



3) $2X^2 + 8X + 6$

4) $2X^2 + 8X + 8$



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

6)

$$\begin{array}{r} 3X+4 \\ \times\ X+3 \\ \hline 9X+12 \\ 3X^2+4X \\ \hline 3X^2+13X+12 \end{array}$$

7) $4(X^2 + 6X + 9) = 4(X + 3)(X + 3)$

8)

$$\begin{array}{r} X+3 \\ \times\ X+3 \\ \hline 3X+9 \\ X^2+3X \\ \hline X^2+6X+9 \end{array}$$

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

10)

$$\begin{array}{r} 2X+1 \\ \times\ 2X+3 \\ \hline 6X+3 \\ 4X^2+2X \\ \hline 4X^2+8X+3 \end{array}$$

11) $B^{2+6-5} = B^3$

12) A^{B+C}

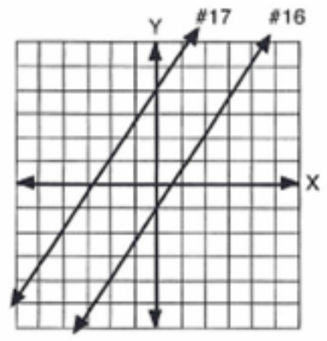
13) $X^{-3}Y^2X^{-1}Y^3X^5 = XY^5$

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

15) 6 x 1,000,000 + 8 x 10,000 + 2 x 1,000 + 7 x 1/100 = 6,082,000.07

16) $Y = 3/2\ X - 1$
see graph

17) $m = 3/2$
$(4) = 3/2(0) + b$
$b = 4$
$Y = 3/2\ X + 4$ or $3X - 2Y = -8$
see graph



18)

hrs	amoeba
1	2
2	4
3	8
4	16

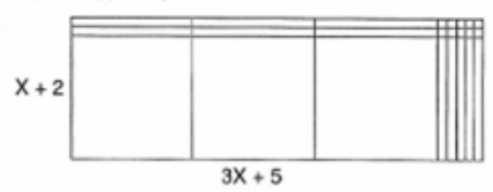
19)

hrs	amoeba
1	2^1
2	2^2
3	2^3
4	2^4

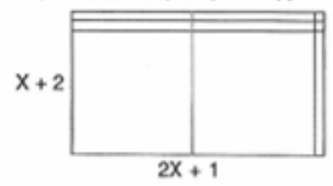
20) 6 hours = 2^6
X hours = 2^X

22D

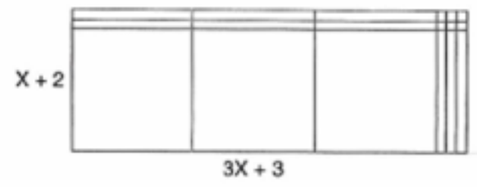
1) $(3X + 5)(X + 2)$



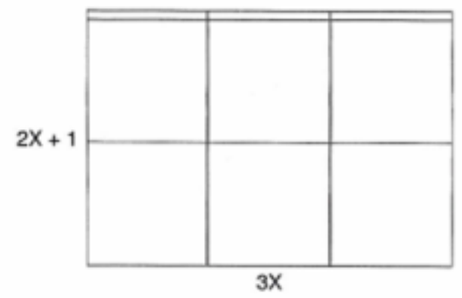
2) $2(2X^2 + 5X + 2) = 2(2X + 1)(X + 2)$



3) $3X^2 + 9X + 6$



4) $6X^2 + 3X$



5) $(3X + 5)(X + 1)$

6)

$$\begin{array}{r} 3X+5 \\ \times\ X+1 \\ \hline 3X+5 \\ 3X^2+5X \\ \hline 3X^2+8X+5 \end{array}$$

7) $(4X + 7)(X + 1)$

8)

$$\begin{array}{r} 4X+7 \\ \times\ X+1 \\ \hline 4X+7 \\ 4X^2+7X \\ \hline 4X^2+11X+7 \end{array}$$

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

10)

$$\begin{array}{r} X+3 \\ \times\ X+2 \\ \hline 2X+6 \\ X^2+3X \\ \hline X^2+5X+6 \end{array}$$

11) $C^{-4+3+0} = C^{-1}$

12) $8^{5-3} = 8^2$

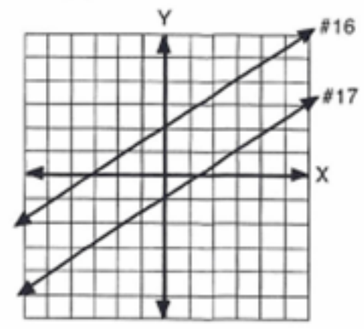
13) $B^5B^2C^{-5}B^4C^3 = B^{11}C^{-2}$

14) $D^6C^{-4}D^2D^4C^0C^{-2} = C^{-6}D^{12}$

15) $8 \times 10^4 + 6 \times 10^3 + 9 \times 10^2 + 4 \times 10^{-1}$

16) $Y = 2/3\ X + 2$
see graph

17) $m = 2/3$
$(-3) = 2/3(-3) + b$
$b = -1$
$Y = 2/3\ X - 1$ or $2X - 3Y = 3$
see graph



18)

weeks	dollars
2	$9
3	$27
4	$81
5	$243

19)

weeks	dollars
1	3^1
2	3^2
3	3^3
4	3^4
5	3^5

20) 20 weeks = 3^{20}
= $3,486,800,000 (May be shown on your calculator as 3.4868×10^9)