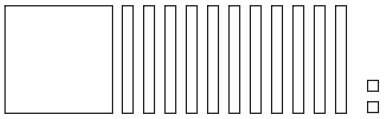
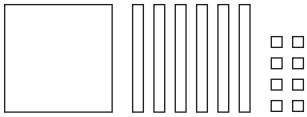
Lesson Practice 20A

1. $X^2 + 11X + 2$



2. $X^2 + 6X + 8$



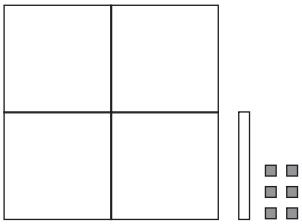
3. $X^2 - 8$



4. $X^2 - 6X + 3$

$3X^2 + 7X - 9$

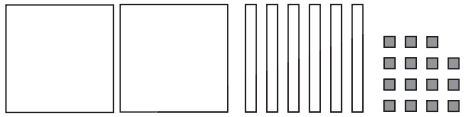
$4X^2 + X - 6$



5. $X^2 \quad - 8$

$X^2 + 6X \quad - 7$

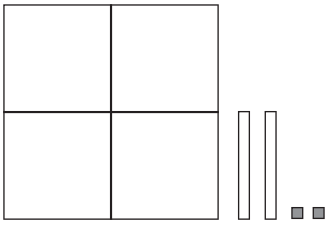
$2X^2 + 6X \; - 15$



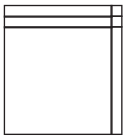
6. $2X^2 + 10X + 7$

$2X^2 \quad - 8X - 9$

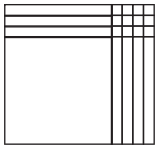
$4X^2 \quad + 2X - 2$



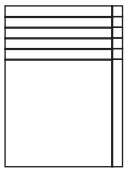
7. $(X + 1)(X + 2) = X^2 + 3X + 2$



8. $(X + 4)(X + 3) = X^2 + 7X + 12$



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



10.

$3X + 2$

$\times X + 1$

$3X + 2$

$3X^2 + 2X$

$3X^2 + 5X + 2$

11.

$5X \quad + 5$

$\times X \quad + 2$

$10X + 10$

$5X^2 + \quad 5X$

$5X^2 + 15X + 10$

12.

$2X + 1$

$\times X + 5$

$10X + 5$

$2X^2 + \quad X$

$2X^2 + 11X + 5$

13.

$X + \quad 8$

$\times 3X + \quad 5$

$5X + 40$

$3X^2 + 24X$

$3X^2 + 29X + 40$

14.
$$\begin{array}{r} X+3 \\ \times\ 2X+1 \\ \hline X+3 \\ 2X^2+6X \\ \hline 2X^2+7X+3 \end{array}$$

15.
$$\begin{array}{r} 3X+2 \\ \times\ 2X+1 \\ \hline 3X+2 \\ 6X^2+4X \\ \hline 6X^2+7X+2 \end{array}$$

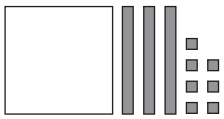
16.
$$\begin{array}{r} 4X+2 \\ \times\ X+3 \\ \hline 12X+6 \\ 4X^2+2X \\ \hline 4X^2+14X+6 \end{array}$$

17.
$$\begin{array}{r} 2X-5 \\ \times\ X+2 \\ \hline 4X-10 \\ 2X^2-5X \\ \hline 2X^2-X-10 \end{array}$$

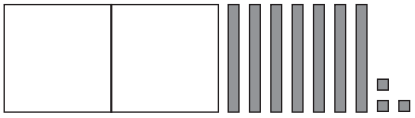
18.
$$\begin{array}{r} 3X+5 \\ \times\ 3X-1 \\ \hline -3X-5 \\ 9X^2+15X \\ \hline 9X^2+12X-5 \end{array}$$

Lesson Practice 20B

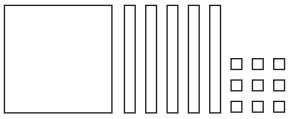
1. X^2-3X-7



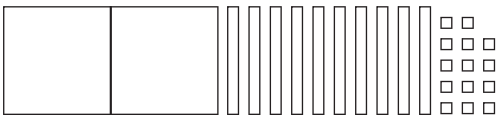
2. $2X^2-7X-3$



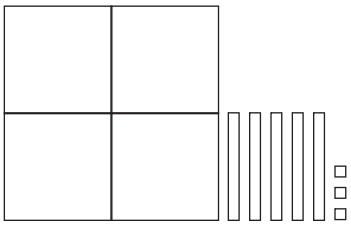
3. X^2+5X+9



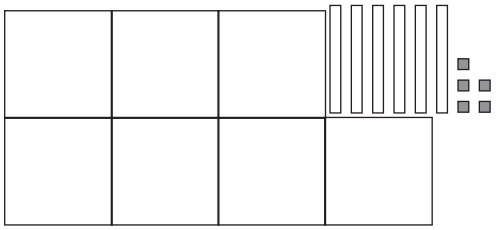
4.
$$\begin{array}{r} X^2+3X+2 \\ X^2+7X+12 \\ \hline 2X^2+10X+14 \end{array}$$



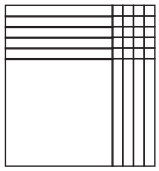
5.
$$\begin{array}{r} X^2+6X+5 \\ 3X^2-X-2 \\ \hline 4X^2+5X+3 \end{array}$$



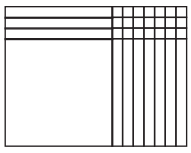
6.
$$\begin{array}{r} 5X^2-5X-10 \\ 2X^2+11X+5 \\ \hline 7X^2+6X-5 \end{array}$$



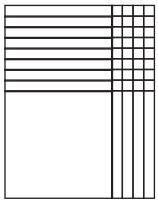
7. $(X+4)(X+5)=X^2+9X+20$



8. $(X+7)(X+3)=X^2+10X+21$



9. $(X+4)(X+8) = X^2+12X+32$



10.
$$\begin{array}{r} 7X+1 \\ \times\ X+2 \\ \hline 14X+2 \\ 7X^2+\ X \\ \hline 7X^2+15X+\ 2 \end{array}$$

11.
$$\begin{array}{r} 3X+\ 7 \\ \times\ X+\ 6 \\ \hline 18X+42 \\ 3X^2+\ 7X \\ \hline 3X^2+25X+42 \end{array}$$

12.
$$\begin{array}{r} 2X+8 \\ \times\ 3X+1 \\ \hline 2X+8 \\ 6X^2+24X \\ \hline 6X^2+26X+8 \end{array}$$

13.
$$\begin{array}{r} X+\ 8 \\ \times\ X-\ 3 \\ \hline -3X-24 \\ X^2+8X \\ \hline X^2+5X-24 \end{array}$$

14.
$$\begin{array}{r} 2X-1 \\ \times\ X+9 \\ \hline 18X-9 \\ 2X^2-\ X \\ \hline 2X^2+\ 17X-9 \end{array}$$

15.
$$\begin{array}{r} 3X+\ 5 \\ \times\ X+\ 2 \\ \hline 6X+10 \\ 3X^2+\ 5X \\ \hline 3X^2+11X+10 \end{array}$$

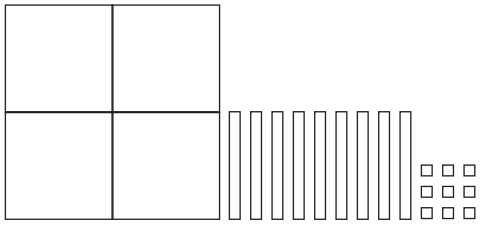
16.
$$\begin{array}{r} 4X-2 \\ \times\ X-3 \\ \hline -12X+6 \\ 4X^2-\ 2X \\ \hline 4X^2-14X+6 \end{array}$$

17.
$$\begin{array}{r} 5X+2 \\ \times\ 3X-3 \\ \hline -15X-6 \\ 15X^2+6X \\ \hline 15X^2-9X-6 \end{array}$$

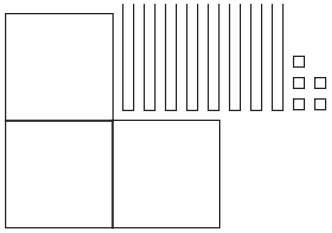
18.
$$\begin{array}{r} 3X+\ 7 \\ \times\ 4X+\ 2 \\ \hline 6X+14 \\ 12X^2+28X \\ \hline 12X^2+34X+14 \end{array}$$

Systematic Review 20C

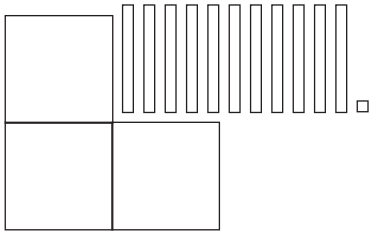
1.
$$\begin{array}{r} 3X^2+7X+6 \\ X^2+2X+3 \\ \hline 4X^2+9X+9 \end{array}$$



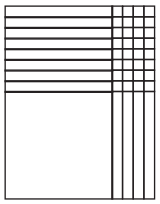
2.
$$\begin{array}{r} 2X^2+5X+1 \\ X^2+3X+4 \\ \hline 3X^2+8X+5 \end{array}$$



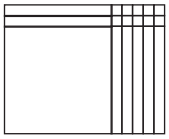
3.
$$\begin{array}{r} 4X^2+\ 8X+2 \\ -X^2+\ 3X-1 \\ \hline 3X^2+11X+\ 1 \end{array}$$



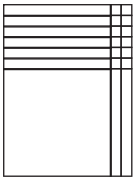
4. $(X+4)(X+8) = X^2+12X+32$



5. $(X+5)(X+2) = X^2+7X+10$



6. $(X+2)(X+6) = X^2+8X+12$



7.
$$\begin{array}{r} 3X+\ 6 \\ \times\ X+\ 2 \\ \hline 6X+12 \\ 3X^2+\ 6X \\ \hline 3X^2+12X+12 \end{array}$$

8.
$$\begin{array}{r} 2X+\ 5 \\ \times\ X+\ 3 \\ \hline 6X+15 \\ 2X^2+\ 5X \\ \hline 2X^2+11X+15 \end{array}$$

9.
$$\begin{array}{r} 4X-5 \\ \times\ X+1 \\ \hline 4X-5 \\ 4X^2-5X \\ \hline 4X^2-\ X-5 \end{array}$$

10. $\dfrac{1}{X^{-4}} = X^4$

11. $X^{-3} = \dfrac{1}{X^3}$

12. $5^2 \times 3^0 \times 5^{-4} = 5^{2+(-4)} \times 1 = 5^{-2}$

13. $A^4 \div A^7 = A^{4-7} = A^{-3}$ or $\dfrac{1}{A^3}$

14. $(5^2)^5 = 5^{2\times5} = 5^{10}$

15. $(5)^{12} = (5)^{3\times4} = (5^3)^4$

16. $\sqrt{196} = 14$

17. $C^{-5} \times C^2 = C^{-5+2} = C^{-3}$ or $\dfrac{1}{C^3}$

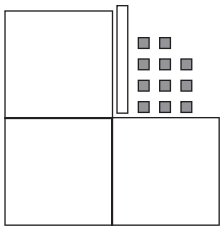
18.
$$\begin{array}{r} X+\ 4 \\ \times\ X+\ 5 \\ \hline 5X+20 \\ X^2+4X \\ \hline X^2+9X+20 \end{array}$$

19. $A = X^2+9X+20 = (6)^2+9(6)+20 =$
$36+54+20 = 110$ square units

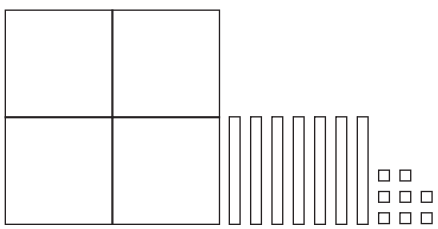
20. $(X+4)(2) \Rightarrow$ $2X\ +8$
$(X+5)(2) \Rightarrow$ $\times\ 2X+10$
$20X+80$
$4X^2+16X$
$4X^2+36X+80$

Systematic Review 20D

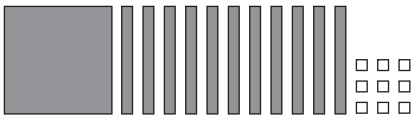
1.
$$\begin{array}{r} X^2-3X-\ 7 \\ 2X^2+4X-\ 4 \\ \hline 3X^2+\ X-11 \end{array}$$



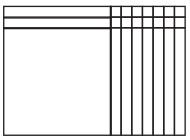
2.
$$\begin{array}{r} X^2+11X+2 \\ 3X^2-\ 4X+6 \\ \hline 4X^2+\ 7X+8 \end{array}$$



3.
$$\begin{array}{r} X^2 - 10X - 5 \\ -2X^2 - X + 14 \\ \hline -X^2 - 11X + 9 \end{array}$$



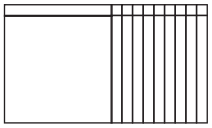
4. $(X+2)(X+7) = X^2 + 9X + 14$



5. $(2X+3)(X+4) = 2X^2 + 11X + 12$



6. $(X+1)(X+9) = X^2 + 10X + 9$



7.
$$\begin{array}{r} 2X + 4 \\ \times\ X + 3 \\ \hline 6X + 12 \end{array}$$
$$\begin{array}{r} 2X^2 + 4X \\ \hline 2X^2 + 10X + 12 \end{array}$$

8.
$$\begin{array}{r} 3X - 1 \\ \times\ X + 4 \\ \hline 12X - 4 \end{array}$$
$$\begin{array}{r} 3X^2 - X \\ \hline 3X^2 + 11X - 4 \end{array}$$

9.
$$\begin{array}{r} 2X - 3 \\ \times\ X - 4 \\ \hline -8X + 12 \end{array}$$
$$\begin{array}{r} 2X^2 - 3X \\ \hline 2X^2 - 11X + 12 \end{array}$$

10. $\frac{1}{X^4} = X^{-4}$

11. $\frac{1}{Y^{-5}} = Y^5$

12. $3^7 \times 4^3 \times 4^{-2} = 3^7 4^{3+(-2)} = 3^7 4^1$ or $3^7 \times 4$

13. $B^5 \div B^1 = B^{5-1} = B^4$

14. $\left(8^3\right)^6 = 8^{3\times 6} = 8^{18}$

15. $(2)^{15} = (2)^{3\times 5} = \left(2^3\right)^5$

16. $\sqrt{225} = 15$

17. $D^{-3} \times D^8 \times D^{-7} = D^{-3+8+(-7)} = D^{-2}$ or $\frac{1}{D^2}$

18.
$$\begin{array}{r} 2X + 4 \\ \times\ X + 4 \\ \hline 8X + 16 \end{array}$$
$$\begin{array}{r} 2X^2 + 4X \\ \hline 2X^2 + 12X + 16 \end{array}$$

19. $A = 2X^2 + 12X + 16 =$
$2(10)^2 + 12(10) + 16 =$
$2(100) + 120 + 16 =$
$200 + 120 + 16 = 336$ square units

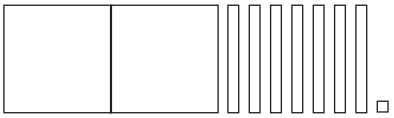
20.
$$\begin{array}{r} 2X^2 + 12X + 16 \\ X^2 + 3X + 1 \\ \hline 3X^2 + 15X + 17 \end{array}$$

Systematic Review 20E

1. $X^2 + 3X - 2$

$\underline{X^2 + 4X + 3}$

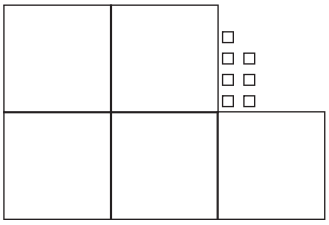
$2X^2 + 7X + 1$



2. $3X^2 + 2X - 1$

$\underline{2X^2 - 2X + 8}$

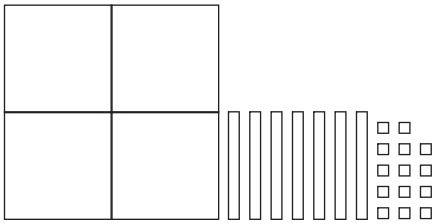
$5X^2 \quad + 7$



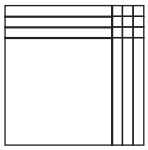
3. $5X^2 + 4X + \ \ 7$

$\underline{-X^2 + 3X + \ \ 7}$

$4X^2 + 7X + 14$



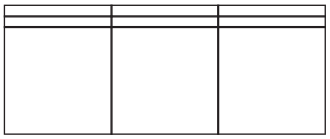
4. $(X + 3)(X + 3) = X^2 + 6X + 9$



5. $(2X + 4)(X + 2) = 2X^2 + 8X + 8$



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



7. $\begin{array}{r} 2X - 3 \\ \times \ \ X - 2 \\ \hline -4X + 6 \end{array}$

$\underline{2X^2 - 3X}$

$2X^2 - 7X + 6$

8. $\begin{array}{r} X - 1 \\ \times \ X - 6 \\ \hline -6X + 6 \end{array}$

$\underline{X^2 - X}$

$X^2 - 7X + 6$

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

$\underline{2X^2 + 2X}$

$2X^2 - 4X - 6$

10. $\dfrac{1}{X^5} = X^{-5}$

11. $Y^{-2} = \dfrac{1}{Y^2}$

12. $7^{-2} \times 7^5 \div 7^{-2} = 7^{-2+5-(-2)} = 7^5$

13. $A^7 \div B^3 = A^7B^{-3}$ or $\dfrac{A^7}{B^3}$

14. $\left(5^2\right)^5 = 5^{2\times5} = 5^{10}$

15. $(5)^{12} = (5)^{3\times4} = \left(5^3\right)^4$

16. $-\sqrt{169} = -13$

17. $C^0C^{-4}D^8D^{-7}D^{-3}C^3 =$

$C^{0+(-4)+3}D^{8+(-7)+(-3)} =$

$C^{-1}D^{-2}$ or $\frac{1}{CD^2}$

18.
$$\begin{array}{r} 3N+4 \\ +2N+5 \\ \hline 5N+9 \end{array}$$

19. $5N+9 = 5(10)+9 = 50+9 = 59$

20.
$$\begin{array}{r} 2Y+7 \\ \times\ 7Y+5 \\ \hline 10Y+35 \\ 14Y^2+49Y \\ \hline 14Y^2+59Y+35 \end{array}$$

Honours Lesson 20H

1.

x(# of months)	0	1	2	3	4
m(mass in grams)	200	100	50	25	12.5

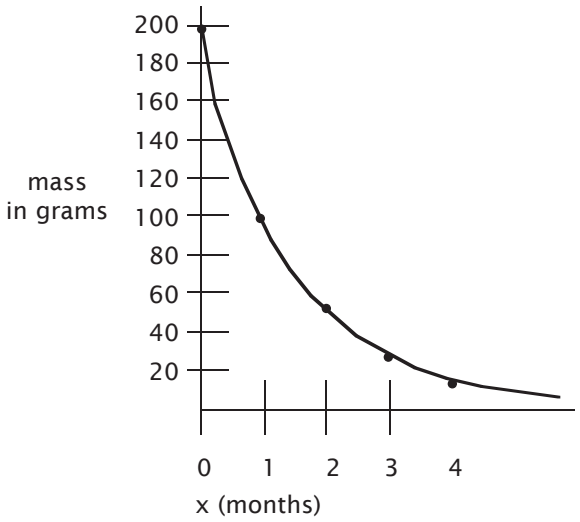
2. 200 g

3. 1 month

4. 2 months

5. 12.5 g

6.



7. $m = 200(.5)^x$

$m = 200(.5)^6$

$m = 200(.0156) = 3.125$ g

Test 20

1. A : equation is a specific kind of polynomial called a trinomial

2. D :
$$\begin{array}{r} X^2+3X+2 \\ +\ X^2+4X+5 \\ \hline 2X^2+7X+7 \end{array}$$

3. A :
$$\begin{array}{r} X^2+X+10 \\ +\ X^2-2X+\ 4 \\ \hline 2X^2-\ X+14 \end{array}$$

4. E :
$$\begin{array}{r} X^2+8X+6 \\ +\ X^2-3X-1 \\ \hline 2X^2+5X+5 \end{array}$$

5. E :
$$\begin{array}{r} X^2-5X-2 \\ +\ X^2-4X-3 \\ \hline 2X^2-9X-5 \end{array}$$

6. C :
$$\begin{array}{r} 2X+3 \\ +\ 4X-5 \\ \hline 6X-2 \end{array}$$

7. B :
$$\begin{array}{r} 2X^2-9X+5 \\ +\ X^2+4X-1 \\ \hline 3X^2-5X+4 \end{array}$$

8. C :

$$\begin{array}{r} 4X+3 \\ \times\ X+1 \\ \hline 4X+3 \\ 4X^2+3X \\ \hline 4X^2+7X+3 \end{array}$$

9. B :

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

10. A :

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

11. C :

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

12. D :

$$\begin{array}{r} X-3 \\ \times\ X-6 \\ \hline -6X+18 \\ X^2-3X \\ \hline X^2-9X+18 \end{array}$$

13. B : Multiplying the two first terms:

$7X \cdot X = 7X^2$

14. B : Multiplying the two first terms:

$2X \cdot X = 2X^2$

15. B : trinomial