Lesson 22

1) 20, 35690

2) 20, 35, 35690

3) 20, 35690

4) 105, 75084

5) 6055, 45759

6) 792, 1 639, 90 959

7) digits add to 33, so it is a multiple of 3
$692\ 835 \div 3 = 230\ 945$
it ends in 5, so it is a multiple of 5
$230\ 945 \div 5 = 46\ 189$
$4\ 618 - 18 = 4\ 600$: not a multiple of 7
$4 + 1 + 9 = 14; 6 + 8 = 14; 14 - 14 = 0$
so it is a multiple of 11
$46\ 189 \div 11 = 4\ 199$
$4 + 9 = 13; 1 + 9 = 10; 13 - 10 = 3$
not a multiple of 11
try 13: $4\ 199 \div 13 = 323$
try 17: $323 \div 17 = 19$
prime factors of 692 835 are:
$3 \times 5 \times 11 \times 13 \times 17 \times 19$

Lesson 23

1) $P = 2W + 2L$
$2(X - 5) + 2(2X + 9) =$
$2X - 10 + 4X + 18 =$
$6X + 8$

2) $6(8) + 8 = 48 + 8 = 56$
$W = (8) - 5 = 3$
$L = 2(8) + 9 = 25$
$3 + 3 + 25 + 25 = 56$
yes

3) $(X - 3) + (X + 18) + (X^2 - 2) =$
$X^2 + 2X + 13$

4) $(5)^2 - 2 = 25 - 2 = 23$
$(5) - 3 = 2$
$(5) + 18 = 23$

5) $(4X + 3) + (3X + 1) + (X) + (2X) + (X) +$
$((4X + 3) - (2X)) + (3X + 1) =$
$14X + 5 + (2X + 3) = 16X + 8$

6) room:
$4(3) + 3 = 15$ ft.
$3(3) + 1 = 10$ ft.
closet is 3 ft. x 6 ft.

7) $16(3) + 8 = 56$ ft.

8) 6

9) $56 \times .10 = 5.6$ ft. of waste
$56 + 5.6 = 61.6$ ft. total
7 lengths should be purchased

Lesson 24

1) $4 \times 6 \times .5 = 12$ cu. ft.

2) $3 \times 3 \times 3 = 27$ cu. ft.

3) $27 - 12 = 15$ cu. ft.

4) $5 \times 6 \times .5 = 15$ cu. ft.

5) $15 + 12 = 27$ cu. ft.
27 cu. ft. = 1 cu. yd.
no sand will be left over

6) Mr. Brown:
$\dfrac{12}{27}$ of 40 = $17.78
Mr. White:
$\dfrac{15}{27}$ of 40 = $22.22

7) $12 \times 18 = 216$ sq. ft.

8) $216 \times .5 = 108$ cu. ft.

9) $108 \div 27 = 4$ cu. yd.

10) $4 \times 80 = \$320$

11) $\$500 - \$320 = \$180$

12) $12 \times 24 \times .5 = 144$ cu. ft.
$144 \div 27 = 5.33$ cu. yd.
$10 - 4 = 6$ cu. yd.
yes

Lesson 25

1) $A = 1/2(X + 1)(2X - 6) =$
$1/2(2X^2 - 4X - 6) =$
$X^2 - 2X - 3$
$(4)^2 - 2(4) - 3 = 16 - 8 - 3 = 5$ sq. units

2) $A = (2X + 1)(X + 7) =$
$2X^2 + 15X + 7$

3) $A = (X)(2X) = 2X^2$

4) closet:
$2(5)^2 = 2(25) = 50$ sq. ft.
bedroom:
$2(5)^2 + 15(5) + 7 = 50 + 75 + 7 = 132$ sq. units

5) $(X + 8)(2X + 2)$

6) $((5) + 8)((2(5) + 2) = (13)(12) = 156$ sq. ft.
$156 - 132 = 24$ sq. ft.

7) 156 sq. ft. + 50 sq. ft. = 206 sq. ft.
$206 \div 9 = 22.89$ sq. yds. (rounded)
23 sq. yds. will need to be purchased

8) $23 \times 15 = \$345$

9) $23 \times 10 = \$230$
$230 + 150 = \$380$
no, the cost of installation will more than offset the per-yard cost savings

10) $L = 2(2X^2 + 2X - 7) + 2(X^2 + 3X - 2) =$
$4X^2 + 4X - 14 + 2X^2 + 6X - 4 =$
$6X^2 + 10X - 18$
$6(2)^2 + 10(2) - 18 = 24 + 20 - 18 = 26$ in.

11) $P = 6(2X^2 - 4X + 1) = 12X^2 - 24X + 6$
$2(5)^2 - 4(5) + 1 = 50 - 20 + 1 = 31$ units