Application and Enrichment Solutions

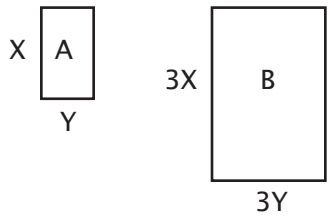
Application and Enrichment Lesson 1

1. $135 \div 9 = 15$;
   $15 \times 2 = 30$ people approved.
   $135 \div 5 = 27$ people disapproved.
   $30 + 27 = 57$ people answered.
   $135 - 57 = 78$ people didn't answer.
   More people didn't answer.
2. $49{,}170 \div 1{,}250 = 39$ r.420
   39 times with 420 mi^2 left over
3. $2 \times \$35.99 = \$71.98$
   $\$71.98 + \$15.95 = \$87.93$
   $\$87.93 - \$5.00 = \$82.93$
   $\$100.00 - \$82.93 = \$17.07$ change
4. $\$17.07 - \$10.00 = \$7.07$ change
   $\$7.07 - \$5.00 = \$2.07$;
   $\$2.07 - \$2.00 = \$0.07$;
   $\$0.07 - \$0.05 = \$0.02$;
   a ten, a five, two ones, a nickel, and two pennies
5. $24 \times 12 = 288$ per case;
   $900 \div 288 = 3.125$
   rounded to next whole number is 4.
6. $1{,}260 \div 60 = 21$ hours
7. $15 + (-33) = -18$;
   $-18 + 5 = -13°$

Application and Enrichment Lesson 2

1. Beginning price was \$60, and he purchased 30 shares, so he spent $30 \times \$60$, or about \$1,800. Ending price was \$45, and he sold 30 shares, so he received $30 \times \$45$, or \$1,350. $\$1{,}800 - \$1{,}350 = \$450$ lost
2. $\frac{3}{8} + \frac{1}{8} + \frac{3}{8} = \frac{7}{8}$ of a mile traveled
   $\frac{8}{8} - \frac{7}{8} = \frac{1}{8}$ of a mile left
3. ran $\frac{3}{8} + \frac{3}{8} = \frac{6}{8} = \frac{3}{4}$ mile
   $5{,}280 \div 4 = 1{,}320$; $1{,}320 \times 3 =$ 3,960 ft running
   jogged $\frac{1}{8}$ mile
   $5{,}280 \div 8 = 660$ ft jogging
   Distance walking is the same as distance jogging, so that is also 660 ft.
4. $21 \times 60 = 1{,}260$ per hour
   $1{,}260 \times 24 = 30{,}240$ per day
   $30{,}240 \times 365 = 11{,}037{,}600$ per year
5. $-5 + 4 - 8 + 10 + 5 - 4 - 6 = -4$ gallons
6. $-4 \times 4 = -16$ qt

Application and Enrichment Lesson 3

1. $68 \div 4 = 17$ units on a side
   17 x 17 = 289 $units^2$
2. 8 x 6 = 48 $units^2$
   16 x 12 = 192 $units^2$
   $192 \div 48 = 4$ times the original
3. $4x3 = 12$ $units^2$
   $12 \div 48 = \frac{1}{4}$ the original
4. 

   area of rectangle A = XY $units^2$
   area of rectangle B = 9XY $units^2$
   $9XY \div XY = 9$
   The area of B is 9 times that of A.
5. 39

6. 13 This can easily be solved by drawing a diagram or a number line.

7. rectangle: $14 \times 16 = 224$ in^2

triangle: $\frac{1}{2} \times 14 \times 15 = 105$ in^2

total: $224 + 105 = 329$ in^2

8. $3.14(15^2) = 706.5$ in^2

$3.14(12^2) = 452.16$ in^2

$706.5 - 452.16 = 254.34$ in^2

Application and Enrichment Lesson 4

1. $\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$

$\frac{6}{6} - \frac{5}{6} = \frac{1}{6}$

2. $12:00 - 7:30 = 4:30$

$4:30 + 3:00 = 7:30$ hours worked

$7.5 \times 4.65 = \$34.875$, or \$34.88 earned

3. $\frac{3}{4} = \frac{15}{20}$ or $\frac{30}{40}$; $\frac{4}{5} = \frac{16}{20}$ or $\frac{32}{40}$

E. $\frac{31}{40}$

4. $\frac{3}{4} = \frac{18}{24}; \frac{5}{6} = \frac{20}{24}$

A or $\frac{19}{24}$ is an answer.

Check other fractions by using the Rule of Four to compare each with the two given fractions.

E also falls between the given fractions.

$\frac{3}{4} \Leftrightarrow \frac{11}{14}, \frac{42}{56} \Leftrightarrow \frac{44}{56}$

$\frac{5}{6} \Leftrightarrow \frac{11}{14}, \frac{70}{84} \Leftrightarrow \frac{66}{84}$

You can also change each fraction to a decimal for easy comparison.

5. It will be quadrupled:

$3.14(5^2) \approx 78.5$ ft^2

$3.14(10^2) \approx 314$ ft^2

$314 \div 78.5 = 4$

6. $12 \times 22 = 264$ in^2

7. rectangle:

$18 \times 30 = 540$ in^2

paralellogram:

$8 \times 15 = 120$ in^2

$540 - 120 = 420$ in^2

8. area of square:

$36 \times 36 = 1{,}296$ cm^2

semicircles:

$\frac{1}{2}(3.14)(5^2) \approx 39.25$ cm^2

$39.25 \times 4 \approx 157$ cm^2

$1{,}296 - 157 \approx 1{,}139$ cm^2

Application and Enrichment Lesson 5

1. \$1.00

$5 \times \$1.00 = \$5.00$

2. \$2.00 the first day

\$4.00 the second day

\$16.00 the third day

\$256.00 the fourth day

\$65,536.00 the fifth day

\$65,814.00 total

3. $3 \times 2 = 6$ units^2

$9 \times 4 = 36$ units^2

4. Sketches and dimensions will vary. The student should notice that when the dimensions are squared, the area will be squared.

5. Sketches and dimensions will vary. The student should notice that when the dimensions are cubed, the area will be cubed.

6. Area = base × height, so the area of this rectangle will be ab units^2. If the length and the width of the rectangle are both cubed, the new area will be a^3b^3 units^2, which can also be expressed as $(ab)^3$ units^2.

7. If the radius is doubled, the area will be four times greater.

Ex : $r = 2$, $A \approx 3.14(4) \approx 12.56$ units^2

$r^2 = 4$, $A \approx 3.14(16) \approx 50.24$ units^2;

new area is 4 times original area

8. If you start with a radius of 3 and square it, the new area will be 9 times the original area. Squaring the radius of a circle causes the area to increase by a factor of r^2.

9. $A = 10\left(\frac{20+15}{2}\right)$

$= 10\left(\frac{35}{2}\right)$

$= \frac{350}{2} = 175$ in^2

10. trapezoid:

$12\left(\frac{21+26}{2}\right) = 12\left(\frac{47}{2}\right)$

$= 6(47) = 282$ cm^2

large semicircle:

$\frac{3.14(6)^2}{2} \approx \frac{3.14(36)}{2}$

$\approx 3.14(18) \approx 56.52$ cm^2

small semicircle:

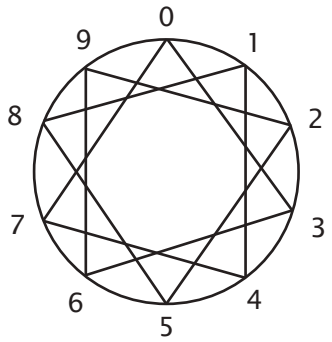
$\frac{3.14(2)^2}{2} \approx \frac{3.14(4)}{2}$

$\approx \frac{12.56}{2} \approx 6.28$ cm^2

$282 - 56.52 - 6.28 \approx 219.2$ cm^2

Application and Enrichment Lesson 6

1.



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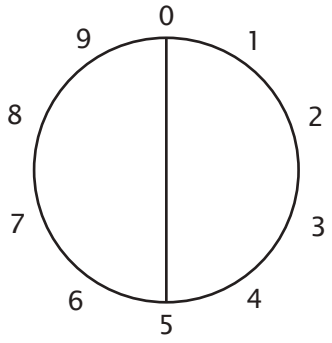

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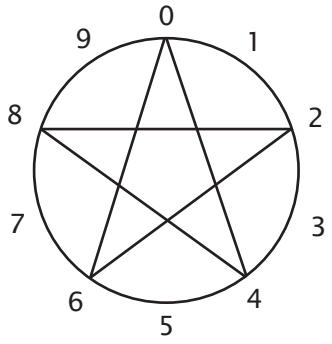

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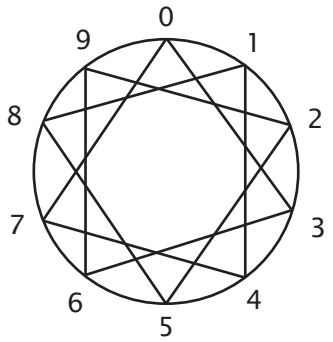


5. 3 facts and 7 facts (or 4 and 6 facts)
6. 12
7. 28
8. 88; multiply one less than the number of weeks by four to get the number of rooms.

Application and Enrichment Lesson 7

There may be alternate ways to describe some patterns. If you get the next number in the sequence correct, your description is valid.

1. Add 7 to the last number to find the next number in the sequence.
2. 35
3. Square the last number to find the next number in the sequence.
4. 65,536
5. Add one more to the last number each time: $1+4=5$; $5+5=10$; $10+6=16$
6. $16+7=23$
$23+8=31$
7. Add twice as many to the last number each time: $1+2=3$; $3+4=7$; $7+8=15$
8. $15+16=31$
$31+32=63$
9. Add the last two numbers in the sequence to find the next: $1+2=3$; $2+3=5$; $3+5=8$
10. $5+8=13$
$8+13=21$
11.

step	1	2	3	4	5	6	7
blocks	1	3	6	10	15	21	28

12. Add one more than the number that was added in the previous step.
$28+8=36$
13. Take the number of steps times one more than the number of steps and divide by 2.
$9(9+1)\div 2=$
$9(10)\div 2=$
$90\div 2=45$

Application and Enrichment Lesson 8

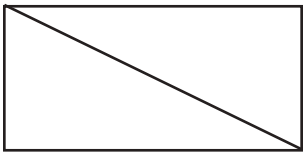
1. sum, how many, total in all
2. difference, how many more, have left
3. times, product, fraction of
4. how many for each, how many parts
5. $2+5=7$
$7-1=6$
$(2+5)-1=6$ pencils
6. $K+M+Q$
7. $X+Y$ total treats
$(X+Y)\div Z$ treats per person
8. $\frac{1}{3}$ completed, $\frac{2}{3}$ to go
$\frac{2}{3}\times(A+B)$ or $\frac{2(A+B)}{3}$
$\frac{2A+2B}{3}$ is also correct.

Application and Enrichment Lesson 9

1. $\frac{A}{A}+\frac{B}{A}=\frac{A+B}{A}$
2. $\frac{Y}{Z}-\frac{X}{Z}=\frac{Y-X}{Z}$
3. $\frac{A+B}{E}+\frac{C}{E}=\frac{A+B+C}{E}$
4. $\frac{A}{X}+\frac{B}{Y}=\frac{AY}{XY}+\frac{BX}{XY}=\frac{AY+BX}{XY}$
5. $\frac{EF}{T}-\frac{G}{S}=\frac{EFS}{TS}-\frac{GT}{TS}=\frac{EFS-GT}{TS}$
6. $\frac{X}{RS}+\frac{X}{QS}=\frac{XQ}{QRS}+\frac{XR}{QRS}=\frac{XQ+XR}{QRS}$
7. $\frac{A}{B}\times\frac{C}{D}=\frac{AC}{BD}$
8. $\frac{X}{R}\times\frac{X}{S}=\frac{X^2}{RS}$
9. $\frac{DF}{YZ}\times\frac{Y}{D}=\frac{DFY}{YZD}=\frac{F}{Z}$
10. $\frac{A}{B}\div\frac{A}{B}=\frac{A\div B}{A\div B}=\frac{1}{1}=1$
    $\frac{A}{B}\div\frac{A}{B}=\frac{A\div A}{B\div B}=\frac{1}{1}=1$
    $\frac{A}{B}\div\frac{A}{B}=\frac{AB}{AB}=\frac{1}{1}=1$
11. $\frac{Q}{Z}\div\frac{YZ}{T}=\frac{QT}{ZT}\div\frac{YZ^2}{ZT}=$
    $\frac{QT\div YZ^2}{ZT\div ZT}=\frac{QT}{YZ^2}$
12. $\frac{X}{R}\div\frac{R}{X}=\frac{X^2}{RX}\div\frac{R^2}{RX}=\frac{X^2\div R^2}{RX\div RX}=\frac{X^2}{R^2}$
13. $\frac{Q}{X}+\frac{R}{P}=\frac{QP}{XP}+\frac{XR}{XP}=\frac{QP+XR}{XP}$
14. $\frac{DT}{S}\times\frac{C}{D}=\frac{DTC}{SD}=\frac{TC}{S}$
15. $\frac{L}{B}\div\frac{U}{B}=\frac{L\div U}{B\div B}=\frac{L\div U}{1}=\frac{L}{U}$
16. $X=A-Y$
17. $Y=A-X$
18. $5X-4X=B+B$
    $X=B+B$
    $X=2B$

Application and Enrichment Lesson 10

1. direct route
   $18^2+24^2=H^2$
   $324+576=900$
   30 miles = H
   same way he came
   18 + 24 = 42 miles
   $42-30$ = 12 miles shorter
   by direct route
2. $15^2+36^2=H^2$
   $225+1296=1521$
   39 ft = H
   $39+3=42$ ft
3. $3^2+4^2=H^2$
   $9+16=25$
   5 miles = H
   $5+5=10$ miles
4. $20^2+48^2=H^2$
   $400+2304=2704$
   52 mi = H
   $P=20+48+20+48=136$ mi
   $136+52=188$ miles of fence



5. $\frac{A}{B}\div\frac{C}{D}=\frac{AD}{BD}\div\frac{BC}{BD}=$
   $\frac{AD\div BC}{BD\div BD}=\frac{AD\div BC}{1}=\frac{AD}{BC}$
6. $\frac{A}{B}\times\frac{D}{C}=\frac{AD}{BC}$
7. $\frac{AD}{BC}=\frac{AD}{BC}$
8. $\frac{XY}{Z}\div\frac{B}{CD}=\frac{XYCD}{ZCD}\div\frac{ZB}{ZCD}=$
   $\frac{XYCD\div ZB}{ZCD\div ZCD}=\frac{XYCD\div ZB}{1}=\frac{XYCD}{ZB}$
   $\frac{XY}{Z}\times\frac{CD}{B}=\frac{XYCD}{ZB}$
   The answers are equal.

Application and Enrichment Lesson 11

1. Multiply by 3 and add 1.

2. 202

3. Divide by 2.

4. $\frac{5}{8}$

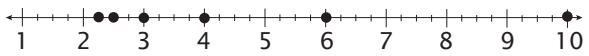
5. Take the square root.

6. 2

7. Subtract half of what was subtracted the previous time.

8. $2\frac{1}{2}$; $2\frac{1}{4}$

9.



10. 2; no

11.

step	1	2	3	4	5
circles	1	4	9	16	25
squares	4	8	12	16	20

12. The number of circles equals the step number squared.

13. The number of squares equals the step number times 4.

14. $8^2 = 64$ circles
$8 \times 4 = 32$ squares

Application and Enrichment Lesson 12

1. 1×36
2×18
3×12
4×9
6×6

2. $P = 2(1) + 2(36) = 2 + 72 = 74$ units
$P = 2(2) + 2(18) = 4 + 36 = 40$ units
$P = 2(3) + 2(12) = 6 + 24 = 30$ units
$P = 2(4) + 2(9) = 8 + 18 = 26$ units
$P = 2(6) + 2(6) = 12 + 12 = 24$ units

3. 6×6

4. 6×10

5. 1×15

6. 1×5
2×4
3×3

7. $1 \times 5 = 5$ units^2
$2 \times 4 = 8$ units^2
$3 \times 3 = 9$ units^2

8. $3 \times 3 = 9$ ft^2

9. The shape she chooses would depend on what she intended it to be used for. Some possibilities:
$5 \times 5 = 25$ ft^2
$4 \times 6 = 24$ ft^2
$3 \times 7 = 21$ ft^2

10. They enclose the most space with least exposure.

Application and Enrichment Lesson 13

1. $AX = ABC$
$X = BC$

2. $XY - B = Q$
$XY = B + Q$
$X = \frac{B + Q}{Y}$

3. $CDX + E = RD$
$CDX = RD - E$
$X = \frac{RD - E}{CD}$

4. $YX - YT = YZ$
$X - T = Z$
$X = Z + T$

5. $Q(X + B) = R(X + C)$
$QX + QB = RX + RC$
$QX - RX = RC - QB$
$X(Q - R) = RC - QB$
$X = \frac{RC - QB}{Q - R}$

6. $AX - BX - C = CX + X + E$
$AX - BX - CX - X = E + C$
$X(A - B - C - 1) = E + C$
$X = \dfrac{E + C}{A - B - C - 1}$

7. $\sqrt{32} = 5.7$

8. $\sqrt{150} = 12.2$

9. $\sqrt{75} = 8.7$

10. $\sqrt{481} = 21.9$

11. $L^2 + L^2 = H^2$
$9^2 + 7^2 = H^2$
$81 + 49 = H^2$
$130 = H^2$
$H = \sqrt{130}$
between 11 and 12:
$11^2 = 121$
$12^2 = 144$

12. 11.4 ft
$0.4 \times 12 = 4.8"$
to the nearest inch
11'5"

Application and Enrichment Lesson 14

1. $X + X + 20 = 144$
$2X + 20 = 144$
$2X = 124$
$X = 62$ on one shelf
$62 + 20 = 82$ books on the other shelf
$62 + 82 = 144$ books total

2. X boys went out for swimming.
$X + 18$ boys went out for baseball.
$X + X + 18 = 48$
$2X + 18 = 48$
$2X = 30$
$X = 15$ boys for swimming
$X + 18 = 33$ boys for baseball
$15 + 33 = 48$ boys total

3. Lisa made X cards.
$X + 3X = 32$
$4X = 32$
$X = 8$ cards for Lisa
$8 \cdot 3 = 24$ cards for June
24 + 8 = 32 cards total

4. $P = 2L + 2W$
$(40) = 2(16) + 2W$
$40 = 32 + 2W$
$8 = 2W$
$4 = W$
$2(4) + 2(16) = 40$
$8 + 32 = 40$
$40 = 40$

5. J = number of dollars Jill earned
$J + 2J + 3J = \$150$
$6J = \$150$
$J = \$25$ for Jill
$2 \cdot \$25 = \$50$ for Joan
$3 \cdot \$25 = \$75$ for Deb
$\$25 + \$50 + \$75 = \$150$ total

6. $P = 2L + 2W$
$22 = 2(X) + 2(X + 1)$
$22 = 2X + 2X + 2$
$20 = 4X$
$X = 5$ in for the short side
$X + 1 = 6$ in for the long side
$2(5) + 2(6) = 10 + 12 = 22$ in

Application and Enrichment Lesson 15

1. rectangular walls:
$2(25 \times 12) + 2(18 \times 12) =$
$2(300) + 2(216) =$
$600 + 432 = 1{,}032$ ft^2
triangular sections:
$2\left(\frac{1}{2}\right)(12 \times 18) = 216$ ft^2
total:
$1{,}032 + 216 = 1{,}248$ ft^2

2. $1{,}248 \div 425 = 2.94$ gal (rounded)
2.94×2 coats $= 5.88$ gal, so
6 gal will need to be purchased.
$6 \times 28 = \$168$

3. If 2 5-gallon buckets were purchased:
$2 \times 120 = \$240.00$
In a real-life situation you probably would have purchased one 5-gallon bucket and a 1-gallon bucket.
$120 + 28 = \$148$
$168 - 148 = \$20$ savings

4. $1{,}248 \div 250 = 5$ gal(rounded)
5×2 coats $= 10$ gal
$10 \times 20 = \$200$
The more expensive paint is a better buy because you don't have to buy as much of it.

5. $4(18) + 4(25) =$
$72 + 100 =$
172 ft^2
$1248 - 172 = 1076 \text{ ft}^2$

6. $1076 \times 1.12 = 1205.12$
13 squares

7. whole rectangle:
$12 \times 18 = 216 \text{ ft}^2$
closet:
$6 \times 3 = 18 \text{ ft}^2$
cutout:
$4 \times 8 = 32 \text{ ft}^2$
$216 - 18 - 32 = 166 \text{ ft}^2$

8. 9 sq ft in a yd^2
$166 \div 9 = 18.44 \text{ yd}^2$(rounded)

9. $18.44 \times 1.10 = 20.28$(rounded)
21 yd^2 needed
$12 \times 21 = \$252$

10. $166 + 18 = 184 \text{ ft}^2$
$184 \div 9 = 20.45 \text{ yd}^2$
$20.45 \times 1.10 = 22.495 \text{ yd}^2$
23 yd^2 will be needed.
$23 \times 12 = \$276$

Application and Enrichment Lesson 16

1. Each face is a triangle.
$A = \frac{1}{2}(bh)$
$A = \frac{1}{2}(4)(3.5)$
$A = 7 \text{ in}^2$ per face
$7 \cdot 8 = 56 \text{ in}^2$

2. Each face is a square.
$5 \times 5 = 25 \text{ in}^2$ per face
$25 \times 6 = 150 \text{ in}^2$

3. Each face is a triangle.
$A = \frac{1}{2}(bh)$
$A = \frac{1}{2}(10)(8.7)$
$A = 43.5 \text{ cm}^2$ per face
$43.5 \times 20 = 870 \text{ cm}^2$

4. $4 + 4 = 6 + 2$
$8 = 8$

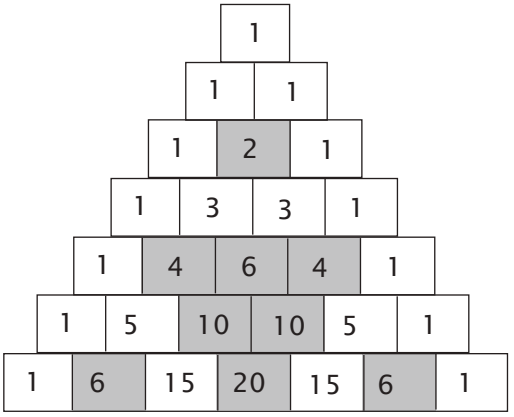
5. $8 + 6 = 12 + 2$
$14 = 14$

6. $12 + 20 = 30 + 2$
$32 = 32$

7. $20 + 12 = 30 + 2$
$32 = 32$

Application and Enrichment Lesson 17

1-2.



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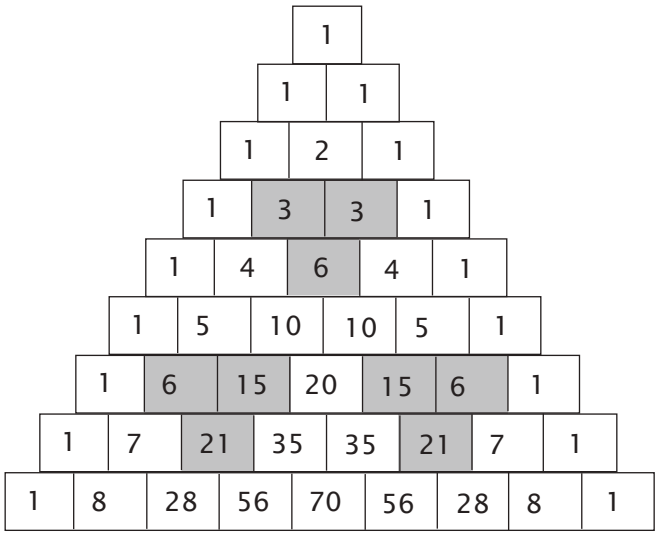

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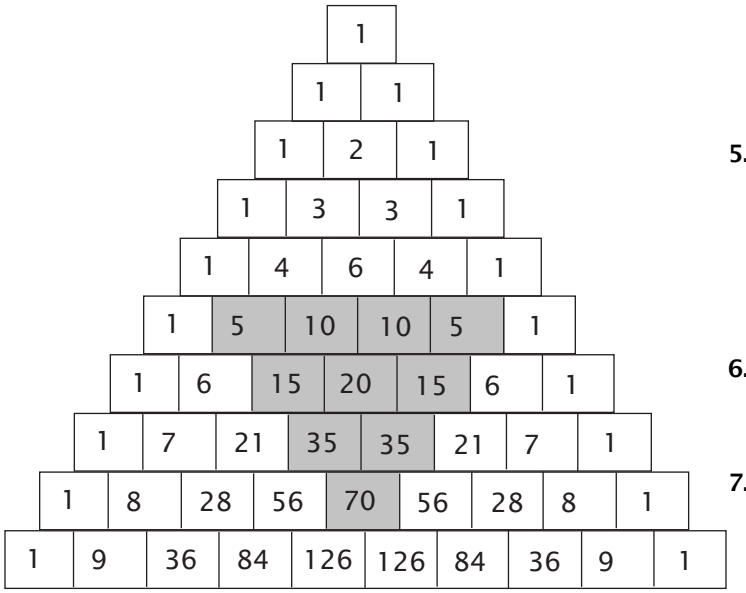


7. $1+4+10=15$
8. Answers will vary, but the sum of the numbers in the "handle" of the "hockey stick" will always equal the number in the smaller rectangle.

Application and Enrichment Lesson 18

1. $M+(M-11)=21$
$2M-11=21$
$2M=32$
$M=\$16$ for the meal
$16-11=\$5.00$ for dessert

2. $6-7+3-4=-2$ mi east, or 2 miles west. The answer should not be written as a negative number because it is a distance, and distance is always positive.

3. $X+(X-200)=300$
$2X-200=300$
$2X=500$
$X=250$
Isaac has \$250.

4. Let J = the number of dollars John earned
$J+(J-18)=60-3.50$
$2J-18=56.50$
$2J=74.50$
$J=\$37.25$

5. In a square, the perimeter is 4 times the length of one side, so:
$S=(S+57)\div 4$
$4S=S+57$
$3S=57$
$S=19$

6. Distance is always positive, so he should have reported the distance as 20 ft.

7. $P=W+W+L+L$
$52=W+W+20+20$
$52=2W+40$
$12=2W$
$W=6$ ft

8. using fractions:

$$\left(N \times \frac{9}{5}\right) + 32 = (N - 32) \times \frac{5}{9}$$

$$45\left(N \times \frac{9}{5}\right) + 45(32) = (N - 32) \times \frac{5}{9}(45)$$

Multiplying each term by 45 cancels the denominator, as 9 and 5 both go into 45 evenly.

$$81N + 1{,}440 = (N - 32) \times 25$$
$$81N + 1{,}440 = 25N - 800$$
$$56N = -800 - 1{,}440$$
$$56N = -2{,}240$$
$$N = -40°$$

using decimals:

$$1.8N + 32 = (N - 32) \times 0.56 \text{(rounded)}$$
$$1.8N + 32 = 0.56N - 17.92$$
$$1.8N - 0.56N = -17.92 - 32$$
$$1.24N = -49.92$$
$$124N = -4992$$
$$N = -40.26°$$

(In this case, the fractions give the exact value and the decimals give an approximate value because of the rounding.)

Application and Enrichment Lesson 19

1. $\frac{8+6}{6} = \frac{180}{F}$

$\frac{14}{6} = \frac{180}{F}$

$14F = 6(180)$

$7F = 3(180)$

$7F = 540$

$F = 77\frac{1}{7}$ gal

2. $\frac{40+20}{20} = \frac{135}{S}$

$\frac{60}{20} = \frac{135}{S}$

$60S = 20(135)$

$3S = 135$

$S = \$45$ for the son

$\$135 - \$45 = \$90$ for the father

3. $\frac{4}{200} = \frac{T}{575-200}$

$\frac{4}{200} = \frac{T}{375}$

$200T = 4(375)$

$50T = 375$

$T = 7\frac{1}{2} = 7$ hrs 30 min

4. $\frac{8.5}{200} = \frac{G}{575}$

$200G = 8.5(575)$

$200G = 4887.5$

$G = 24.4$ gal (rounded)

5. $\frac{3}{2} = \frac{7}{L}$

$3L = 14$

$L = 4\frac{2}{3}$ loaves

She can make 4 whole loaves.

6. $\frac{4}{3} = \frac{T}{81}$

$3T = 324$

$T = 108$ ft

7. $6 \times 5 = M \times 3$

$30 = 3M$

$M = 10$ machines

8. $15 \times 36 = (15+9) \times D$

$540 = 24D$

$D = 22.5$ days

Application and Enrichment Lesson 20

1. $\frac{4}{5.2} = \frac{25}{D}$

$4D = 5.2(25)$

$4D = 130$

$D = 32.5$

33 miles rounded

2. $8.2 + 4.5 = 12.7$ cm

$\frac{4}{12.7} = \frac{25}{D}$

$4D = 12.7(25)$

$4D = 317.5$

$D = 79.375$

79 miles rounded

3. $\frac{5}{7} = \frac{14}{D}$

$5D = 7(14)$

$5D = 98$

$D = 19\frac{3}{5}$ or 19.6 miles

4. $\frac{5}{3} = \frac{D}{6}$

$3D = 5(6)$

$3D = 30$

$D = 10$ cm

5. $\frac{10}{15} = \frac{3{,}000}{D}$

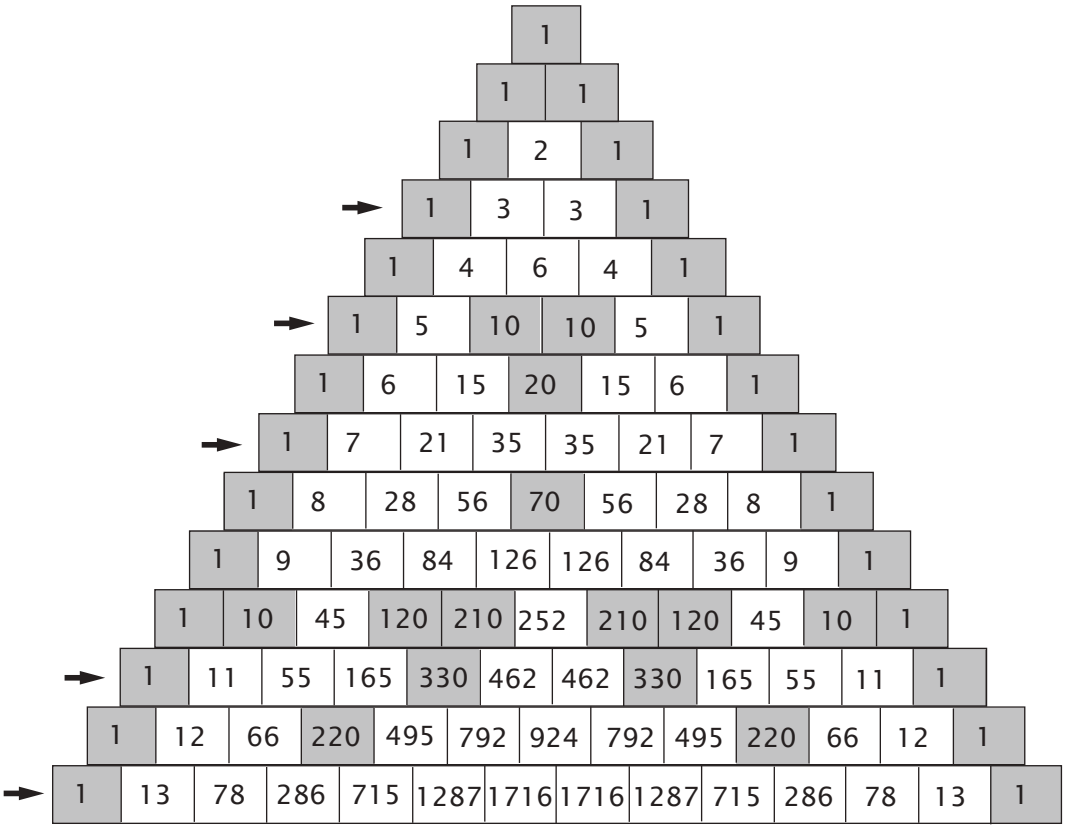
$10D = 15(3{,}000)$

$10D = 45{,}000$

$D = 4{,}500$ miles

Application and Enrichment Lesson 21

1.



2. yes

3. no

4. 11; it holds true (see diagram)

5. The next prime is 13; see diagram for shading of multiples of ten

Application and Enrichment Lesson 22

1. 20; 35,690

2. 20; 35; 35,690

3. 20; 35,690

4. 0; 105; 75,084

5. 6055; 45,759

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:
$3 \times 5 \times 11 \times 13 \times 17 \times 19$

Application and Enrichment 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
The closet is 3 ft x 6 ft.

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

8. 6

9. $56 \times 0.10 = 5.6$ ft of waste
$56 + 5.6 = 61.6$ ft total
7 lengths should be purchased.

Application and Enrichment Lesson 24

1. $4 \times 6 \times 0.5 = 12$ ft^3

2. $3 \times 3 \times 3 = 27$ ft^3

3. $27 - 12 = 15$ ft^3

4. $5 \times 6 \times 0.5 = 15$ ft^3

5. $15 + 12 = 27$ ft^3
27 ft$^3 = 1$ yd^3
No sand will be left over.

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

7. $12 \times 18 = 216$ ft^2

8. $216 \times 0.5 = 108$ ft^3

9. $108 \div 27 = 4$ yd^3

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

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

12. $12 \times 24 \times 0.5 = 144$ ft^3
$144 \div 27 = 5.33$ yd^3
$10 - 4 = 6$ yd^3
yes

Application and Enrichment Lesson 25

1. $A = \frac{1}{2}(X + 1)(2X - 6) =$
$\frac{1}{2}(2X^2 - 4X - 6) =$
$X^2 - 2X - 3$
$(4)^2 - 2(4) - 3 = 16 - 8 - 3 = 5$ units^2

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

3. $A = (X)(2X) = 2X^2$
4. closet :
   $2(5)^2 = 2(25) = 50 \text{ ft}^2$
   bedroom:
   $2(5)^2 + 15(5) + 7 = 50 + 75 + 7 =$
   132 units^2
5. $(X + 8)(2X + 2)$
6. $((5) + 8)(2(5) + 2) = (13)(12) =$
   156 ft^2
   $156 - 132 = 24 \text{ ft}^2$
7. $156 \text{ ft}^2 + 50 \text{ ft}^2 = 206 \text{ ft}^2$
   $206 \div 9 = 22.89 \text{ yd}^2 (\text{rounded})$
   23 yd^2 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. $L = 2(2X^2 + 2X - 7) + 2(X^2 + 3X - 2) =$
    $4X^2 + 4X - 14 + 2X^2 + 6X - 4 =$
    $6X^2 + 10X - 18$
    $6(2)^2 + 10(2) - 18 =$
    $24 + 20 - 18 = 26 \text{ in}$
11. $P = 6(2X^2 - 4X + 1) = 12X^2 - 24X + 6$
    $2(5)^2 - 4(5) + 1 = 50 - 20 + 1 = 31 \text{ units}$

Application and Enrichment Lesson 26

1. $7 - 5 = 2$
   $\frac{2}{5} = 2 \div 5 = 0.4 = 40\%$ growth
2. $5'4" = 64"$ $6'1" = 73"$
   $73 - 64 = 9$
   $\frac{9}{64} = 9 \div 64 = 0.1406 =$
   14% growth (rounded)
3. $6{,}500 - 5{,}000 = 1{,}500$
   $\frac{1{,}500}{5{,}000} = 1{,}500 \div 5{,}000 =$
   $0.3 = 30\%$ growth
4. $16 - 7 = 9$
   $\frac{9}{7} = 9 \div 7 = 1.2857 =$
   129% growth (rounded)
5. $5{,}000 - 4{,}000 = 1{,}000$
   $\frac{1{,}000}{5{,}000} = 1{,}000 \div 5{,}000 =$
   $0.2 = 20\%$ decrease
6. $6{,}500 - 4{,}000 = 2{,}500$
   $\frac{2{,}500}{6{,}500} = 2{,}500 \div 6{,}500 =$
   $0.3846 = 38\%$ decrease

Application and Enrichment Lesson 27

1. Prairie Dogs:
   $\frac{65 + 71 + 35 + 10}{4} = 45.25$
   Raccoons :
   $\frac{30 + 30 + 50 + 30}{4} = 35$
   Hound Dogs:
   $\frac{22 + 71 + 89 + 80}{4} = 65.5$
   The Hound Dogs had the best record.
2. median
3. median
4. game 1: 30
   game 2: 71
   game 3: 50
   game 4: 30
   $\frac{30 + 71 + 50 + 30}{4} = 45.25$
5. 30
6. $80 - 10 = 70$
7. game 1: $65 - 22 = 43$
   game 2: $71 - 30 = 41$
   game 3: $89 - 35 = 54$
   $\frac{43 + 41 + 54 + 70}{4} = 52$

Application and Enrichment Lesson 28

1. $\frac{1.024+1.021+1.023+1.019}{4} =$
   1.022 (rounded)
2. $1.024 - 1.022 = 0.002$
   $0.002 \div 1.022 = 0.0019$ or 0.19%
3. $1.022 - 1.019 = 0.003$
   $0.003 \div 1.022 = 0.0029$ or 0.29%
4. $\frac{2.056+2.123+2.007}{3} = 2.062$
5. $2.123 - 2.062 = 0.061$
   $0.061 \div 2.062 = 0.0296 = 2.96\%$
6. $2.062 - 2.007 = 0.055$
   $0.055 \div 2.062 = 0.0267 = 2.67\%$
7. No, the gauge is not giving results within allowed margin of error.

Application and Enrichment Lesson 29

1. 1,000 g
   1 kg
2. $100 \times 100 \times 100 = 1{,}000{,}000$ cc
   $1{,}000{,}000 \div 1{,}000 = 1{,}000$ l
3. 2 ml
4. $160 \times 125 = 20{,}000$ m^2
   $20{,}000 \div 10{,}000 = 2$ ha
5. $7 \times 10{,}000 = 70{,}000$ m^2
6. $1{,}000 \times 1{,}000 = 1{,}000{,}000$ m^2 in a km^2
   $1{,}000{,}000 \div 10{,}000 = 100$ ha in km^2

Application and Enrichment Lesson 30

1. yes
2. rational
3. rational
4. yes
5. no
6. rational, real