

Honors Solutions

Honors Lesson 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
- $49,170 \div 1,250 = 39$ r.420
39 times with 420 sq mi left over
- $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
- $\$17.07 - \$10.00 = \$7.07$ change
 $\$7.07 - \$5.00 = \$2.07$;
 $\$2.07 - \$2.00 = \$.07$;
 $\$.07 - \$.05 = \$.02$;
a ten, a five, two ones, a nickel,
and two pennies
- $24 \times 12 = 288$ per case;
 $900 \div 288 = 3.125$
rounded to next whole number is 4.
- $1,260 \div 60 = 21$ hours
- $15 + (-33) = -18$;
 $-18 + 5 = -13^\circ$

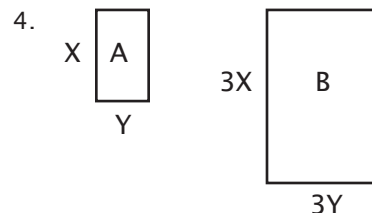
Honors Lesson 2

- 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.
- $\frac{3}{8} + \frac{1}{8} + \frac{3}{8} = \frac{7}{8}$ of a mile traveled
 $\frac{8}{8} - \frac{7}{8} = \frac{1}{8}$ of a mile left

- 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 660 ft also.
- $21 \times 60 = 1,260$ per hour
 $1,260 \times 24 = 30,240$ per day
 $30,240 \times 365 = 11,037,600$ per year
- $-5 + 4 - 8 + 10 + 5 - 4 - 6 = -4$ gallons
- $-4 \times 4 = -16$ qts

Honors Lesson 3

- $68 \div 4 = 17$ units on a side
 $17 \times 17 = 289$ units²
- $8 \times 6 = 48$ units²
 $16 \times 12 = 192$ units²
 $192 \div 48 = 4$ times the original
- $4 \times 3 = 12$ units²
 $12 \div 48 = \frac{1}{4}$ the original



- area of rectangle A = XY units²
area of rectangle B = $9XY$ units²
 $9XY \div XY = 9$
The area of B is 9 times that of A.
- 39

6. 13 This can easily be solved by drawing a diagram or a number line.
7. rectangle: $14 \times 16 = 224 \text{ in}^2$
 triangle: $\frac{1}{2} \times 14 \times 15 = 105 \text{ in}^2$
 total: $224 + 105 = 329 \text{ in}^2$
8. $3.14(15^2) = 706.5 \text{ in}^2$
 $3.14(12^2) = 452.16 \text{ in}^2$
 $706.5 - 452.16 = 254.34 \text{ in}^2$

5. It will be quadrupled:
 $3.14(5^2) = 78.5 \text{ ft}^2$
 $3.14(10^2) = 314 \text{ ft}^2$
 $314 \div 78.5 = 4$
6. $12 \times 22 = 264 \text{ in}^2$
7. rectangle:
 $18 \times 30 = 540 \text{ in}^2$
 parallelogram:
 $8 \times 15 = 120 \text{ in}^2$
 $540 - 120 = 420 \text{ in}^2$
8. area of square:
 $36 \times 36 = 1,296 \text{ cm}^2$
 semicircles:
 $\frac{1}{2}(3.14)(5^2) = 39.25 \text{ cm}^2$
 $39.25 \times 4 = 157 \text{ cm}^2$
 $1,296 - 157 = 1,139 \text{ cm}^2$

Honors 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. $\frac{3}{4} = \frac{18}{24}$; $\frac{5}{6} = \frac{20}{24}$
 We can see at a glance that
 A or $\frac{19}{24}$ is an answer.
 Check other fractions by using the rule of 4 to compare each with the two given fractions.
 E also falls between the given fractions.
 $\frac{3}{4} \Leftrightarrow \frac{11}{14}, \frac{42}{56} \Leftrightarrow \frac{44}{56}$
 $\frac{5}{6} \Leftrightarrow \frac{11}{14}, \frac{70}{84} \Leftrightarrow \frac{66}{84}$
 Or, change each fraction to a decimal for easy comparison.

Honors 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
 \$64,814.00 total
3. $3 \times 2 = 6 \text{ units}^2$
 $9 \times 4 = 36 \text{ units}^2$
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 x height, so the area of this rectangle will be ab . If the length and the width of the rectangle are both cubed, the new area will be a^3b^3 , which can also be expressed as $(ab)^3$.
7. If the radius is doubled, the area will increase four-fold.

8. Ex : $r = 2, A = 3.14(4) = 12.56$
 $r^2 = 4, A = 3.14(16) = 50.24$
 New area is 4 times original area
 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. $A = 10 \frac{20+15}{2}$
 $= 10 \frac{35}{2}$
 $= \frac{350}{2} = 175 \text{ sq in}$

10. Trapezoid : $12 \frac{21+26}{2} =$
 $12 \frac{47}{2} = 6(47) = 282 \text{ cm}^2$

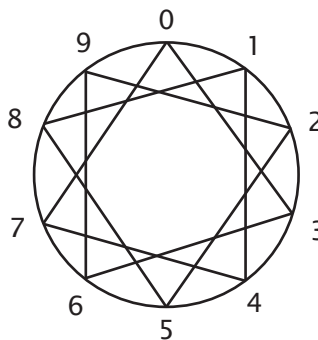
Large semicircle: $\frac{3.14(6)^2}{2} =$
 $\frac{3.14(36)}{2} = 3.14(18) = 56.52 \text{ cm}^2$

Small semicircle: $\frac{3.14(2)^2}{2} =$
 $\frac{3.14(4)}{2} = \frac{12.56}{2} = 6.28 \text{ cm}^2$

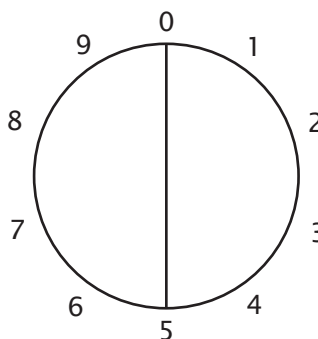
$282 - 56.52 - 6.28 = 219.2 \text{ cm}^2$

Honors Lesson 6

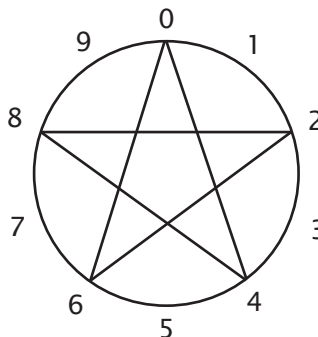
1.



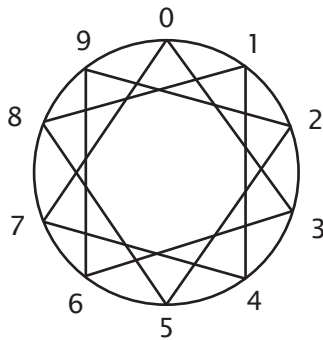
2.



3.



4.



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

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.
 If you figured that out without looking, give yourself a pat on the back!
 $9(9+1) \div 2 =$
 $9(10) \div 2 =$
 $90 \div 2 = 45$

Honors Lesson 7

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
 $1 + 2 = 3$; $2 + 3 = 5$; $3 + 5 = 8$

Honors 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

Honors Lesson 9

- $\frac{A}{A} + \frac{B}{A} = \frac{A+B}{A}$
- $\frac{Y}{Z} - \frac{X}{Z} = \frac{Y-X}{Z}$
- $\frac{A+B}{E} + \frac{C}{E} = \frac{A+B+C}{E}$
- $\frac{A}{X} + \frac{B}{Y} = \frac{AY}{XY} + \frac{BX}{XY} = \frac{AY+BX}{XY}$
- $\frac{EF}{T} - \frac{G}{S} = \frac{EFS}{TS} - \frac{GT}{TS} = \frac{EFS-GT}{TS}$
- $\frac{X}{RS} + \frac{X}{QS} = \frac{XQ}{QRS} + \frac{XR}{QRS} = \frac{XQ+XR}{QRS}$
- $\frac{A}{B} \times \frac{C}{D} = \frac{AC}{BD}$
- $\frac{X}{R} \times \frac{X}{S} = \frac{X^2}{RS}$
- $\frac{DF}{YZ} \times \frac{Y}{D} = \frac{DFY}{YZD} = \frac{F}{Z}$
- $\frac{A}{B} \div \frac{A}{B} = \frac{A+B}{A+B} = \frac{1}{1} = 1$
- $\frac{Q}{Z} \div \frac{YZ}{T} = \frac{QT}{ZT} \div \frac{YZ^2}{ZT} =$
 $\frac{QT \div YZ^2}{ZT \div ZT} = \frac{QT}{YZ^2}$
- $\frac{X}{R} \div \frac{R}{X} = \frac{X^2}{RX} \div \frac{R^2}{RX} = \frac{X^2 \div R^2}{RX \div RX} = \frac{X^2}{R^2}$
- $\frac{Q}{X} + \frac{R}{P} = \frac{QP}{XP} + \frac{XR}{XP} = \frac{QP+XR}{XP}$
- $\frac{DT}{S} \times \frac{C}{D} = \frac{DTC}{SD} = \frac{TC}{S}$
- $\frac{L}{B} \div \frac{U}{B} = \frac{L \div U}{B \div B} = \frac{L \div U}{1} = \frac{L}{U}$
- $X = A - Y$
- $Y = A - X$
- $5X - 4X = B + B$
 $X = B + B$
 $X = 2B$

same way he came

$$18 + 24 = 42 \text{ miles}$$

$$42 - 30 = 12 \text{ miles shorter}$$

by direct route

$$2. \quad 15^2 + 36^2 = H^2$$

$$225 + 1296 = 1521$$

$$39 \text{ ft} = H$$

$$39 + 3 = 42 \text{ ft}$$

$$3. \quad 3^2 + 4^2 = H^2$$

$$9 + 16 = 25$$

$$5 \text{ miles} = H$$

$$5 + 5 = 10 \text{ miles}$$

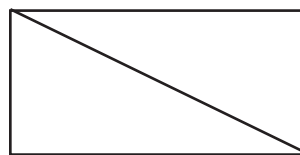
$$4. \quad 20^2 + 48^2 = H^2$$

$$400 + 2304 = 2704$$

$$52 \text{ mi} = H$$

$$P = 20 + 48 + 20 + 48 = 136 \text{ mi}$$

$$136 + 52 = 188 \text{ miles of fence}$$



$$5. \quad \frac{A}{B} \div \frac{C}{D} = \frac{AD}{BD} \div \frac{BC}{BD} =$$

$$\frac{AD+BC}{BD \div BD} = \frac{AD+BC}{1} = \frac{AD}{BC}$$

$$6. \quad \frac{A}{B} \times \frac{D}{C} = \frac{AD}{BC}$$

$$7. \quad \frac{AD}{BC} = \frac{AD}{BC}$$

$$8. \quad \frac{XY}{Z} \div \frac{B}{CD} = \frac{XYCD}{ZCD} \div \frac{ZB}{ZCD} =$$

$$\frac{XYCD \div ZB}{ZCD \div ZCD} = \frac{XYCD \div ZB}{1} = \frac{XYCD}{ZB}$$

$$\frac{XY}{Z} \times \frac{CD}{B} = \frac{XYCD}{ZB}$$

The answers are equal.

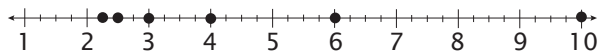
Honors Lesson 10

- direct route
 $18^2 + 24^2 = H^2$
 $324 + 576 = 900$
 $30 \text{ miles} = H$

Honors Lesson 11

- multiply by 3 and add 1
- 202
- divide by 2
- $\frac{5}{8}$

5. take square root of
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

Honors 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. $1 \times 5 = 5$ units²
 $2 \times 4 = 8$ units²
 $3 \times 3 = 9$ units²
8. $3 \times 3 = 9$ ft²
9. The shape she chooses would depend on what she intended it to be used for. Some possibilities:
 $5 \times 5 = 25$ ft²
 $4 \times 6 = 24$ ft²
 $3 \times 7 = 21$ ft²
10. They enclose the most space with least exposure.

Honors 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. $AX - BX - C = CX + X + E$
 $AX - BX - CX - X = E + C$
 $X(A - B - C - 1) = E + C$
 $X = \frac{E + C}{A - B - C - 1}$
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
 $.4 \times 12 = 4.8''$
 to the nearest inch
 11'5"
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

Honors 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

Honors Lesson 15

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

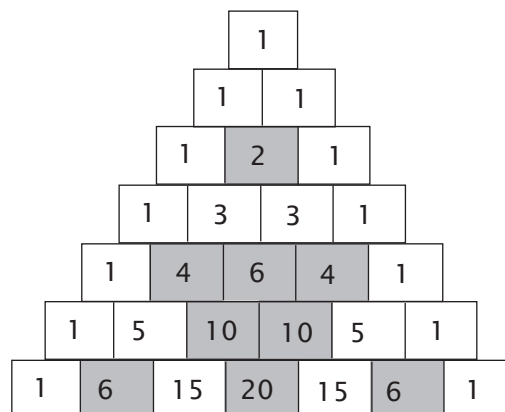
2. $1,248 \div 425 = 2.94$ gal (rounded)
 2.94×2 coats = 5.88 gal, so
 6 gal will need to be purchased
 $6 \times 28 = \$168$
3. if 2 5-gallon buckets were purchased
 $2 \times 120 = \$240.00$
 In a real life situation you probably
 would have purchased one 5-gallon
 bucket, and a 1-gallon bucket.
 $120 + 28 = \$148$
 $168 - 148 = \$20$ 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
 $23 \times 12 = \$276$

Honors Lesson 16

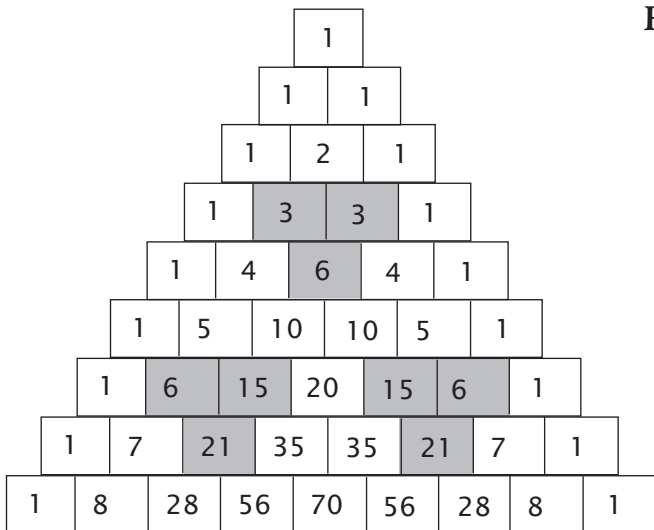
1. each face is a triangle
 $A = \frac{1}{2}(bh)$
 $A = \frac{1}{2}(4)(3.5)$
 $A = 7 \text{ in}^2$ per face
 $7 \cdot 8 = 56 \text{ in}^2$
2. each face is a square
 $5 \times 5 = 25 \text{ in}^2$ per face
 $25 \times 6 = 150 \text{ in}^2$
3. each face is a triangle
 $A = \frac{1}{2}(bh)$
 $A = \frac{1}{2}(10)(8.7)$
 $A = 43.5 \text{ cm}^2$ per face
 $43.5 \times 20 = 870 \text{ in}^2$
4. $4 + 4 = 6 + 2$
 $8 = 8$
5. $8 + 6 = 12 + 2$
 $14 = 14$
6. $12 + 20 = 30 + 2$
 $32 = 32$
7. $20 + 12 = 30 + 2$
 $32 = 32$

Honors Lesson 17

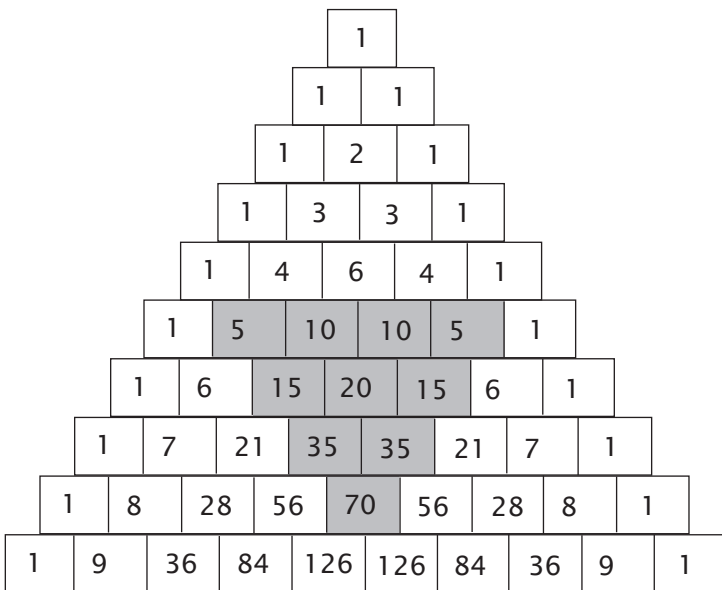
1-2.



3-4.



5-6.



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.

Honors 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:

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

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

$$81N + 1,440 = (N-32) \times 25$$

$$81N + 1,440 = 25N - 800$$

$$56N = -800 - 1,440$$

$$56N = -2,240$$

$$N = -40^\circ$$

using decimals:

$$1.8N + 32 = (N-32) \times .56(\text{rounded})$$

$$1.8N + 32 = .56N - 17.92$$

$$1.8N - .56N = -17.92 - 32$$

$$1.24N = -49.92$$

$$124N = -4992$$

$$N = -40.26^\circ$$

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

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

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

$$200T = 4(375)$$

$$50T = 375$$

$$T = 7\frac{1}{2} =$$

7 hrs 30 min

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

$$200G = 8.5(575)$$

$$200G = 4887.5$$

$$G = 24.4 \text{ gal} \\ (\text{rounded})$$

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

$$3L = 14$$

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

She can make 4 whole loaves.

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

$$3T = 324$$

$$T = 108 \text{ ft}$$

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

$$30 = 3M$$

$$M = 10 \text{ machines}$$

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

$$540 = 24D$$

$$D = 22.5 \text{ days}$$

Honors Lesson 19

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

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

$$14F = 6(180)$$

$$7F = 3(180)$$

$$7F = 540$$

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

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

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

$$60S = 20(135)$$

$$3S = 135$$

$$S = \$45 \text{ for the son}$$

$$\$135 - \$45 = \$90$$

for the father

Honors Lesson 20

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

$$4D = 5.2(25)$$

$$4D = 130$$

$$D = 32.5$$

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

$$5D = 7(14)$$

$$5D = 98$$

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

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

$$3D = 5(6)$$

$$3D = 30$$

$$D = 10 \text{ cm}$$

5. $\frac{10}{15} = \frac{4000}{D}$

$$10D = 15(4000)$$

$$10D = 60,000$$

$$D = 6,000 \text{ miles}$$

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

Honors Lesson 22

1. 20; 35,690

2. 20; 35; 35,690

3. 20; 35,690

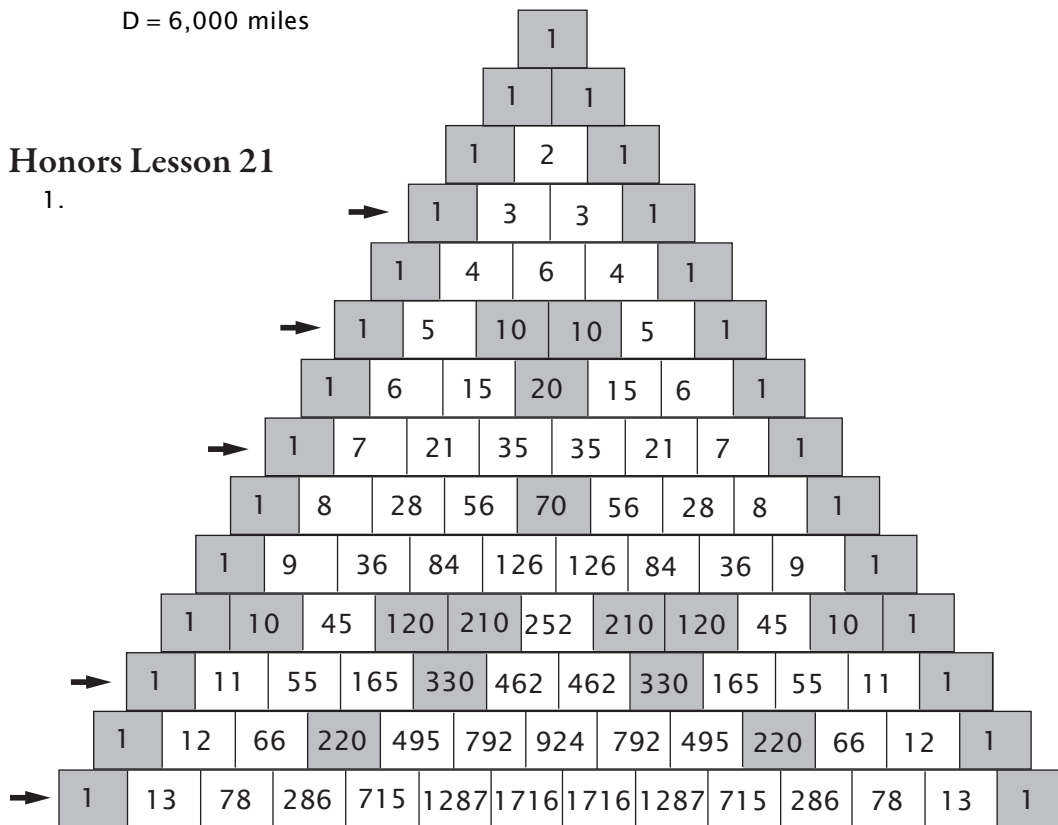
4. 105; 75,084

5. 6055; 45,759

6. 792; 1,639; 90,959

Honors Lesson 21

1.



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. $230,945 \div 5 = 46,189$.
 $4,168 - 18 = 4,600$: 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:
 $3 \times 5 \times 11 \times 13 \times 17 \times 19$

Honors Lesson 23

- $P = 2W + 2L$
 $2(X - 5) + 2(2X + 9) =$
 $2X - 10 + 4X + 18 =$
 $6X + 8$
- $6(8) + 8 = 48 + 8 = 56$
 $W = (8) - 5 = 3$
 $L = 2(8) + 9 = 25$
 $3 + 3 + 25 + 25 = 56$
 yes
- $(X - 3) + (X + 18) + (X^2 - 2) =$
 $X^2 + 2X + 13$
- $(5)^2 - 2 = 25 - 2 = 23$
 $(5) - 3 = 2$
 $(5) + 18 = 23$
- $(4X + 3) + (3X + 1) + (X) + (2X) + (X) +$
 $((4X + 3) - (2X)) + (3X + 1) =$
 $14X + 5 + (2X + 3) = 16X + 8$
- room:
 $4(3) + 3 = 15$ ft
 $3(3) + 1 = 10$ ft
 closet is 3 ft x 6 ft
- $16(3) + 8 = 56$ ft
- 6
- $56 \times .10 = 5.6$ ft of waste
 $56 + 5.6 = 61.6$ ft total
 7 lengths should be purchased

Honors Lesson 24

- $4 \times 6 \times .5 = 12$ ft³
- $3 \times 3 \times 3 = 27$ ft³
- $27 - 12 = 15$ ft³
- $5 \times 6 \times .5 = 15$ ft³
- $15 + 12 = 27$ ft³
 27 ft³ = 1 yd³
 no sand will be left over
- Mr. Brown:
 $\frac{12}{27}$ of 40 = \$17.78
 Mr. White:
 $\frac{15}{27}$ of 40 = \$22.22
- $12 \times 18 = 216$ ft²
- $216 \times .5 = 108$ ft³
- $108 \div 27 = 4$ yd³
- $4 \times 80 = \$320$
- $\$500 - \$320 = \$180$
- $12 \times 24 \times .5 = 144$ ft³
 $144 \div 27 = 5.33$ yd³
 $10 - 4 = 6$ yd³
 yes

Honors Lesson 25

- $A = \frac{1}{2}(X + 1)(2X - 6) =$
 $\frac{1}{2}(2X^2 - 4X - 6) =$
 $X^2 - 2X - 3$
 $(4)^2 - 2(4) - 3 = 16 - 8 - 3 = 5$ units²
- $A = (2X + 1)(X + 7) =$
 $2X^2 + 15X + 7$
- $A = (X)(2X) = 2X^2$

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. $156 \text{ ft}^2 + 50 \text{ ft}^2 = 206 \text{ ft}^2$
 $206 \div 9 = 22.89 \text{ yd}^2$ (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. $P = 6(2X^2 - 4X + 1) = 12X^2 - 24X + 6$
 $2(5)^2 - 4(5) + 1 = 50 - 20 + 1 = 31 \text{ units}$

Honors Lesson 26

1. $7 - 5 = 2$
 $\frac{2}{5} = 2 \div 5 = .4 = 40\% \text{ growth}$
2. $5'4" = 64"$ $6'1" = 73"$
 $73 - 64 = 9$
 $\frac{9}{64} = 9 \div 64 = .1406 =$
 14% growth (rounded)

3. $6,500 - 5,000 = 1,500$
 $\frac{1500}{5000} = 1500 \div 5000 =$
 $.3 = 30\% \text{ growth}$
4. $16 - 7 = 9$
 $\frac{9}{7} = 9 \div 7 = 1.2857 =$
 129% growth (rounded)
5. $5,000 - 4,000 = 1,000$
 $\frac{1000}{5000} = 1000 \div 5000 =$
 $.2 = 20\% \text{ decrease}$
6. $6,500 - 4,000 = 2,500$
 $\frac{2500}{6500} = 2500 \div 6500 =$
 $.3846 = 38\% \text{ decrease}$

Honors Lesson 27

1. Prairie Dogs:
 $\frac{65+71+35+10}{4} = 45.25$
 Rabbits:
 $\frac{30+30+50+30}{4} = 35$
 Hound Dogs:
 $\frac{22+71+89+80}{4} = 65.5$
 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: $89 - 35 = 54$
 $\frac{43+41+54+70}{4} = 52$

Honors Lesson 28

- $\frac{1.024+1.021+1.023+1.019}{4} = 1.022$ (rounded)
- $1.024 - 1.022 = .002$
 $.002 \div 1.022 = .0019$ or .19%
- $1.022 - 1.019 = .003$
 $.003 \div 1.022 = .0029$ or .29%
- $\frac{2.056+2.123+2.007}{3} = 2.062$
- $2.123 - 2.062 = .061$
 $.061 \div 2.062 = .0296 = 2.96\%$
- $2.062 - 2.007 = .055$
 $.055 \div 2.062 = .0267 = 2.67\%$
- No, the gauge is not giving results within allowed margin of error.

Honors Lesson 30

- yes
- rational
- rational
- yes
- no
- rational, real

Honors Lesson 29

- 1,000 g
1 kg
- $100 \times 100 \times 100 = 1,000,000$ cc
 $1,000,000 \div 1,000 = 1,000$ l
- 2 ml
- $160 \times 125 = 20,000$ m²
 $20,000 \div 10,000 = 2$ ha
- $7 \times 10,000 = 70,000$ m²
- $1,000 \times 1,000 = 1,000,000$ m²
in a km²
 $1,000,000 \div 10,000 = 100$ ha in km²