Chapter 2

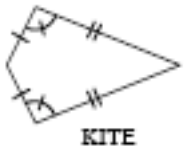
2.1.1:

2-8. **a:** 33 square cm **b:** $33x$ square units **c:** $33x^2 - 50x + 8$ square units

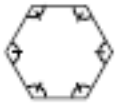
2-9. **a:** $\frac{1}{2}$ **b:** $\frac{1}{6}$

2-10. **a:** isosceles triangle **b:** equilateral triangle **c:** rhombus

2-11.

a. 
KITE

b. 
ISOSCELES TRIANGLE

c. 
REGULAR HEXAGON

d. 
RHOMBUS

2-12. Answers vary. The left circle could be "equilateral", and the right could be "quadrilateral". Assuming this, you could add an equilateral hexagon to the left, a rhombus to the intersection, and a rectangle to the right circle.

2.1.2:

2-18. **a:** Vertical angles, congruent, $3x + 5° = 5x - 57°$, $x = 31°$
b: Straight angle pair, supplementary, $2x + 4x + 150° = 180°$, $x = 5°$

2-19. **a:** $m\measuredangle B = m\measuredangle C$ because the line of symmetry must pass through A (according to the marked sides of equal length) and these angles are on opposite sides of the line of symmetry.
b: Since they are equal, $m\measuredangle B = \frac{1}{2}(124°) = 62°$.

2-20. **a:** square **b:** $(-4,5)$, $(1,5)$, $(-4,0)$, $(1,0)$

2-21. $y = x - 1$; No, because $1 \neq 3 - 1$

2-22. **a:** Vertical; they are equal. **b:** They form a "Z."

2.1.3:

2-29. **a:** $(-2,3)$ **b:** $(-2,3)$, yes

2-30. **a:** 20 square units
b: 2,600 square units; subtract the x and y-coordinates to find the length of the two sides.

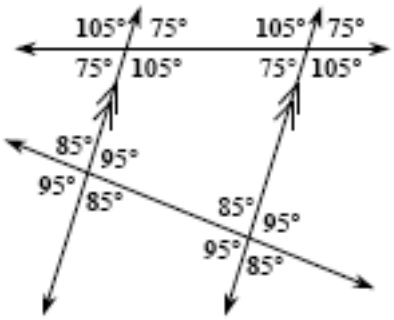
2-31. **a:** We do not know the angles are equal, because we do not know if $\overleftrightarrow{BD} \| \overleftrightarrow{EG}$.
b: The diagram does not have parallel line marks.

2-32. **a:** $x = 17.5$ (corresponding angles)
b: $x = 5$ (multiple relationships can be used)

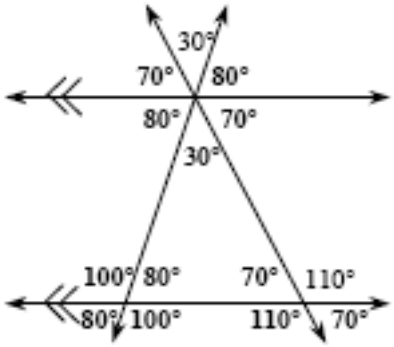
2-33. **a:** an isosceles triangle **b:** a rectangle

2.1.4:

2-38. **a:**



b:



2-39. The slopes are $\frac{2}{3}$ and $-\frac{3}{2}$. Since the slopes are opposite reciprocals, the lines must be perpendicular.

2-40. $(3,-1)$, $(7,-1)$

2-41. They used different units.

2-42. The lines are parallel, so they do not intersect. Therefore, there is no solution.

2.1.5:

2-51. $x = 7°$

2-52. **a:** $x = 10$ units **b:** $x = 6$ **c:** $x = 20°$ **d:** $x = 10°$

2-53. **a:** $x = 4$ and $y = 18$ **b:** $x = -13$ and $y = 6$

2-54. **a:** Should be triangle with horiz. base of length 4 and vertical base of length 3
b: $-\frac{4}{3}$ **c:** Any equation of the form $y = -\frac{3}{4}x + b$

2-55. 2

2.2.1:

2-61. They are all isosceles triangles.

2-62. Reasoning will vary. $a = 118°$, $b = 118°$, $c = 32°$, $d = 32°$

2-63. **a:** $15°$ **b:** $x = 12°$ **,** $m\measuredangle D = 4(12°) + 2° = 50°$ **c:** It is equilateral.

2-64. $A'(-6,-3)$, $B'(-2,-1)$, and $C'(-5,-7)$

2-65. **a:** $y = -\frac{2}{3}x + 3$ **b:** Yes, because the slopes are opposite reciprocals.
c: $y = \frac{1}{2}x + 5$ **d:** Any equation of the form $y = -2x + b$ for all real b values.

2.2.2:

2-70. **a:** $8x^2 - 26x - 7$ **b:** $10x^2 + 31x - 14$
c: $4x^2 - 47x + 33$ **d:** $-6x^2 + 17x - 5$

2-71. area = 28 square units

2-72. **a:** $x = 8°$, right angle is $90°$
b: $x = 20°$, straight angle is $180°$
c: $x = 20°$, sum of angles in a triangle is $180°$
d: $x = 60°$, sum of angles in a triangle is $180°$

2-73. Daniel is correct because the definition of a rectangle is a quadrilateral with four right angles. Since a square has four sides and four right angles, it must be a rectangle.

2-74. **a:** $\frac{4}{52} = \frac{1}{13}$ **b:** $\frac{13}{52} = \frac{1}{4}$ **c:** $\frac{1}{52}$ **d:** $\frac{39}{52} = \frac{3}{4}$

2.2.3:

2-81. **a:** $y = -\frac{6}{5}x + 4$ **b:** $y = \frac{1}{2}x - 2$

2-82. The unshaded triangle is half the area of the rectangle $\left(.5(8)(17) = 68 \text{ sq. in.}\right)$, so the shaded area is the other half.

2-83. **a:** Because when you are not standing up straight, you have changed your height, and you will not get a true measure of your height.
b: Diagram (1) is correct.

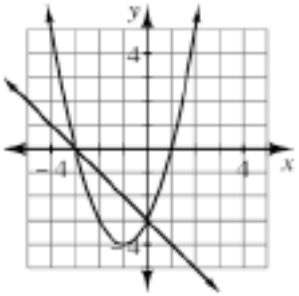
2-84. **a:** If it rains, then Mr. Spelling is unhappy.
b: If you add two even numbers together, then the result is even.
c: If it is Tuesday, then Marla has a piano lesson.

2.2.4:

2-90. **a:** $7^2 = 49$ sq. cm **b:** $0.5(10)(4) = 20$ sq. in.
c: $0.5(16 + 8)(6) = 72$ sq. ft.

2-91. **a:** $15x^2 + 21x$ **b:** $x^2 + 5x + 6$
c: $3x^2 - x - 10$ **d:** $10x^2 - 3x - 4$

2-92. See graph; (–3, 0) and (0, –3)



2-93. **a:** Isosceles Trapezoid because two sides are parallel and the other two sides are the same length.
b: $A'(7,-2)$, $B'(8,-4)$, $C'(2,-4)$, $D'(3,-2)$
c: 10 square units

2-94. **a:** $\frac{12}{52} = \frac{3}{13}$ **b:** $\frac{20}{52} = \frac{5}{13}$ **c:** $\frac{2}{52} = \frac{1}{26}$ **d:** 0

2.3.1:

2-100. **a:** $\sqrt{68} \approx 8.2$, since $\sqrt{64} = 8$, then $\sqrt{68}$ must be a little higher.
b: (1) 2.2, (2) 9.2, (3) 7.1, (4) 4.7

2-101. 17 units

2-102. **a:** $6x + 6$ **b:** $6x + 6 = 78$, so $x = 12$ and the rectangle is 15 cm by 24 cm.
c: $(2 \cdot 12)(12 + 3) = 360$

2-103. **a:** If a polygon is a parallelogram, then its area equals its base times its height.
b: "If a polygon is a triangle, then its area equals one half its base times its height." Arrow diagram: *Polygon is a triangle → area of the polygon equals one-half base times height.*

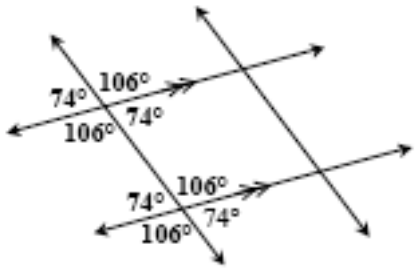
2-104. No, it would take 10 months for Sarita to catch up to Berti.

2.3.2:

2-109. 10 units

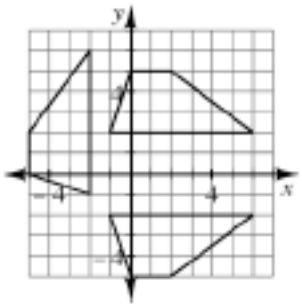
2-110. $y = \frac{6}{5}x - 3$ **b:** $y = -\frac{1}{4}x + 4.5$ **c:** $y = \frac{1}{3}x$ **d:** $y = 2$

2-111.



2-112. **a:** 1 **b:** $\frac{3}{8}$ **c:** $\frac{5}{8}$

2-113. **a:** It is a trapezoid because it has two parallel sides.
b: $A'(-2,-1)$, $B'(-5,0)$, $C'(-5,2)$, $D'(-2,6)$
c: $A'''(1,2)$, $B'''(-2,5)$
d: $\frac{1}{2}(3)(2 + 7) = 13.5$ units



2.3.3:

2-118. **a:** (1) $(5,3)$; (2) $(2,-6)$

b: $p: y = 2x + 8$; $q: y = -\frac{1}{2}x + 3$

c: The solution should be $(-2,4)$.

2-119. **a:** right triangle; slopes are opposite reciprocals

b: 20 square units

c: ≈ 23.4 units

2-120. height = 12 units, area = $\frac{1}{2}(12)(12 + 23) = 210$ square units

2-121. **a:** $x = 28.5°$, Triangle Angle Sum Theorem

b: $x = 23°$, relationships used varies

c: $x = 68°$, corresponding angles are equal because the lines are parallel and base angles of an isosceles triangle are equal.

2-122. 5° and 21°