Chapter 1

1.1.1:

1-3. Shapes (a), (c), (d), and (e) are rectangles.

1-4. **a:** 40 **b:** –6 **c:** 7 **d:** 59

1-5. **a:** $y = x + 3$ **b:** $y = -x^2$ **c:** $y = x^2 + 3$ **d:** $y = 3x - 1$

1-6. **a:** $22a + 28$ **b:** $-23x - 17$ **c:** $x^2 + 5x$ **d:** $x^2 + 8x$

1-7. Possibilities: goes to bank, gets money from parent, gets paid; buys lunch, goes shopping, pays a bill, …

1.1.2:

1-14. Answers vary. Possible responses include "How many sides does it have?", "Does it have a right angle?", "Are any sides parallel?"

1-15. Answers vary. Possible responses include "They have 3 sides of equal length" and "They have 3 angles of equal measure."

1-16. **a:** 3 **b:** 2 **c:** 4

1-17. **a:** $x = -7$ **b:** $c = 4.5$ **c:** $x = 16$ **d:** $k = -7$

1-18. **a:** 12 **b:** 35 **c:** 24 **d:** 7

1.1.3:

1-25. c is correct; $x = 7$

1-26. No. If the points are collinear then they will not form a triangle.

1-27. $y = x - 3$

1-28. **a:** 55.5 square units **b:** 42 square units

1.1.4:

1-32. **a:** $x = \frac{9}{24} = \frac{3}{8} = 0.375$ **b:** no solution
c: $x \approx 6.44$ **d:** $x = 0.5$

1-33. Yes, his plants will be dead. If his plants are indoors, they will be dead because he will be gone for 2 weeks and so he did not water them at least once a week. If he left them outdoors, they will still be dead because it has not rained for 2 weeks, so he needed to water them once a week as well.

1-34. **a:** $y = \frac{2}{3}x - 4$ **b:** $y = -\frac{5}{2}x + \frac{7}{2}$

1-35. 104 sq. mm

1-36. **a:** $-\frac{3}{5}$ **b:** $\frac{6}{3} = \frac{2}{1} = 2$ **c:** $-\frac{3}{6} = -\frac{1}{2}$ **d:** $\frac{0}{7} = 0$

1.1.5:

1-42. **a:** 100° **b:** 170° **c:** 50°

1-43. The graph should be a line with y-intercept $(0, 2)$ and x-intercept $(–2, 0)$.

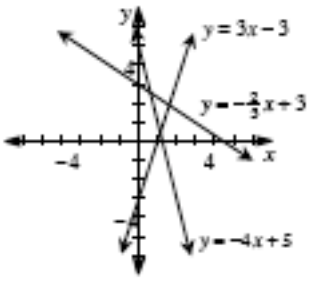
1-44. Perimeter: 74 centimeters, Area: 231 cm^2

1-45. **a:** $y = 5$ **b:** $r = 12$ **c:** $a = 6$ **d:** $m = 5$

1-46. While there are an infinite number of rectangles, possible dimensions with integral measurements are: 1 by 24 (perimeter = 50 units), 2 by 12 (perimeter = 28 units), 3 by 8 (perimeter = 22 units), and 4 by 6 (perimeter = 20 units).

1.2.1:

1-54.



1-55. **a:** 120° **b:** 40° **c:** 230°

1-56. $5x - 2 + 2x + 6 = 67$, $x = 9$, so $5(9) - 2 = 43$ miles

1-57. **a:** 3.75 **b:** 3 **c:** 0 **d:** 3 **e:** ≈ 372.25 **f:** -3.4

1-58. The flag would need to be a rectangle. The height of the cylinder would match the height of the rectangle along the pole, and the cylinder's radius would match the width of the rectangle.

1.2.2:

1-63. yes, yes, no

1-64. **a:** reflection **b:** translation (or two reflections over parallel lines)
c: rotation or rotation and translation
d: rotation or rotation and translation depending on the point of rotation
e: reflection **f:** reflection and then translation or rotation or both

1-65. $19 + 7x - 4 + 10x + 3 = 52$ so $x = 2$. Side lengths are 19, 10, and 23.

1-66. **a:** Area $\approx$ 16 square units **b:** Area $\approx$ 15 square units

1-67. **a:** -4 **b:** 25 **c:** -2

1.2.3:

1-73. **a:** a square **b:** 81 square units
c: $A'(3,-5)$, $B'(-6,-5)$, $C'(-6,4)$, $D'(3,4)$

1-74. **a:** $x = -4.75$ **b:** $x = -94$ **c:** $x \approx 1.14$ **d:** $a = 22$

1-75. y-intercept: $(0, 6)$, x-intercept: $(4, 0)$

1-76. **a:** $y = \frac{4}{3}x - 2$

b: The resulting line coincides with the original line; $y = \frac{4}{3}x - 2$

1-77. -14

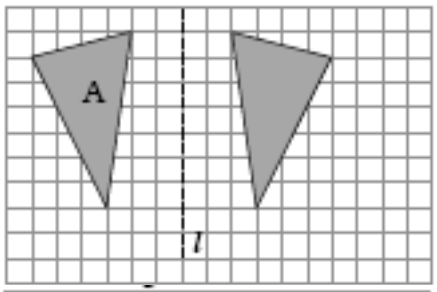
1.2.4:

1-82. \$450

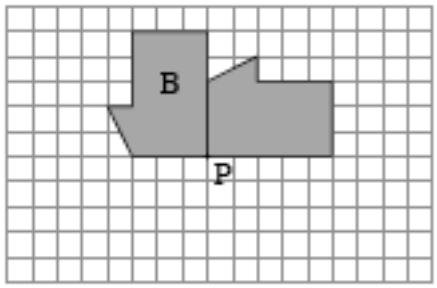
1-83. **a:** $(9,3)$ **b:** $(3,-3)$ **c:** $(-2,-7)$ **d:** $(-52,1483)$

1-84. **a:** 10 square units **b:** 20 square units **d:** 208,680 square units

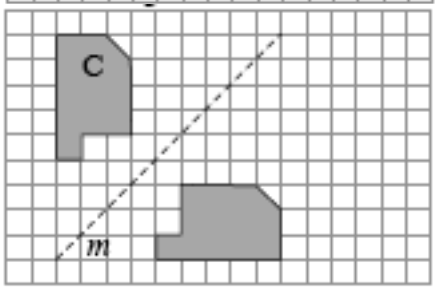
1-85. **a:**



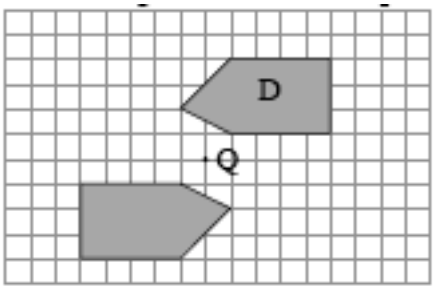
b:



c:



d:



1-86. **a:** The orientation of the hexagon does not change.
b: The orientation of the hexagon does not change.
c: There are 6 lines of symmetry, through opposite vertices and through the midpoints of opposite sides.

1.2.5:

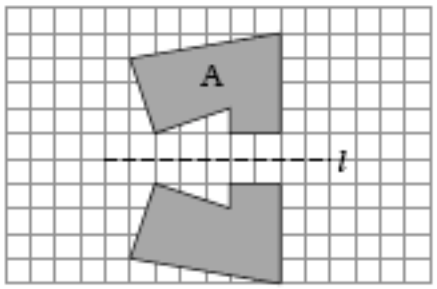
1-92. (a) and (b) are perpendicular, while (b) and (c) are parallel.

1-93. **a:** One possibility: $4(5x+2)=48$ **b:** $x=2$ **c:** $12\cdot12=144$ units

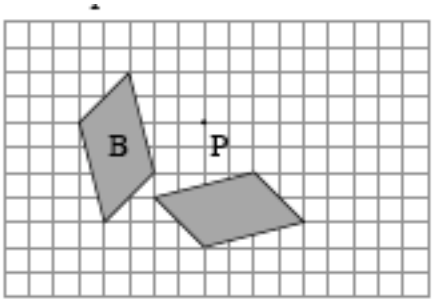
1-94. **a:** heart **b:** square **c:** hexagon **d:** Answers vary.

1-95. The triangles described in (a), (b), and (d) are isosceles.

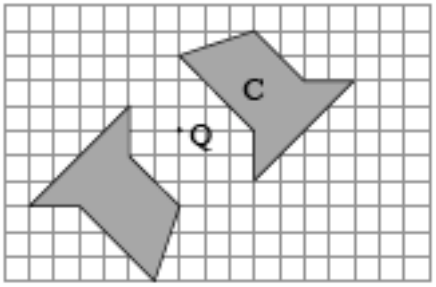
1-96. **a:**



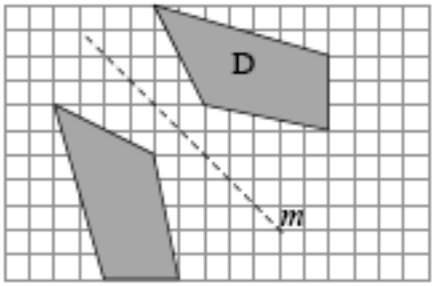
b:



c:



d:



1.3.1:

1-99. Carol: only inside circle #2; Bob: outside both circles; Pedro: only inside circle #1. In order to belong to the intersection of both circles, a person would need to have long hair and study a lot for class.

1-100. **a:** $x=-\frac{9}{33}=-\frac{3}{11}$ **b:** $x=5$ and $x=-\frac{3}{2}$ **c:** $x=1$ **d:** $x=\frac{12}{13}$

1-101. **a:** It looks the same as the original.
b: Solution should be any value of $45k$ where k is an integer.
c: circle

1-102. **a:** $(-6,-3)$ **b:** The vertices are $(6,2)$, $(2,3)$, and $(5,6)$ **c:** $(8,-4)$

1-103. $y=3x+2$

1.3.2:

1-110. rectangle and square

1-111. Answers vary.

1-112. **a:** isosceles triangle **b:** pentagon **c:** parallelogram
d: obtuse scalene triangle **e**: isosceles right triangle **f:** trapezoid

1-113. REFL ONLY: A, B, C, D, E, M, T, U, V, W, Y
ROT. ONLY: N, S, Z
INTERSECTION: H, I, O, X
OUTSIDE BOTH REGIONS: F, G, J, K, L, P, Q, R

1-114. D

1.3.3:

1-121. an isosceles right triangle

1-122. $\frac{1}{535} \approx 0.0019$ No, this probability is very small.

1-123. **a:** $\frac{1}{4}$ **b:** $\frac{3}{4}$ **c:** $\frac{2}{4} = \frac{1}{2}$

1-124. **a:** Yes, it is correct because the two angles make up a 90° angle.
b: $x = 33°$, so one angle is $33 - 10 = 23°$ while the other is $2(33) + 1 = 67°$
c: $23° + 67° = 90°$

1-125. The graph is a parabola with roots $(-3, 0)$ and $(1, 0)$, and y-intercept at $(0, -3)$.