GEOMETRY (COLLEGE PREP & HONORS) SUMMER MATH PACKET

The purpose of these assignments is to ensure you understand the prerequisite skills required to succeed in Geometry. It is expected that all of the content below is material previously taught to you. If you find material that appears to be brand new, please refer to the YouTube playlist Geometry Pre-Requisite Skills for informational videos with explanations and examples. Additionally, an answer key is attached to this document.

These assignments are **optional** but **heavily encouraged**. In the first week or two of school, you will take a test to assess your understanding of the course prerequisite skills. This assessment will be worth 5% of your grade for the first semester.

The suggested timeline is as follows:

Due Date	Assignment	Approximate Time
Sun. 6/15	#1-10	2.5-4 hours
Sun. 7/6	#11-17	2.5-4 hours
Sun 7/27	#18-25	2.5-4 hours

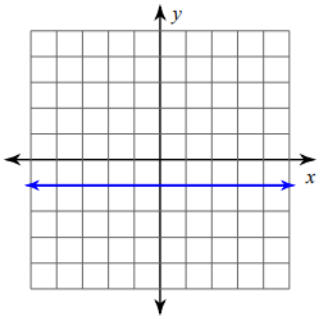
1. On graph paper, label the x-axis and y-axis. Then, plot and label the following points: A(-5,-6), B(0,4), C(-1,0), and D(4,-2)

2. Find the slope of the line through each pair of points.
   a. (19, -16), (-7, -15)
   b. (1,19), (-2,-7)
   c. (-4,7), (-6,-4)
   d. (9,3), (19,-17)

3. Find the distance between each pair of points.
   a. (19, -16), (-7, -15)
   b. (1,19), (-2,-7)
   c. (-4,7), (-6,-4)
   d. (9,3), (19,-17)

4. For each of the graphs below, determine the slope of each line.

a.



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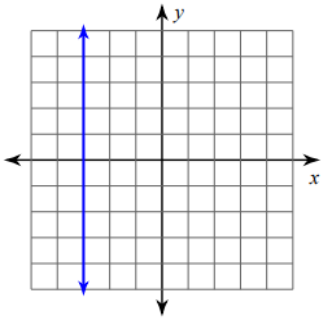

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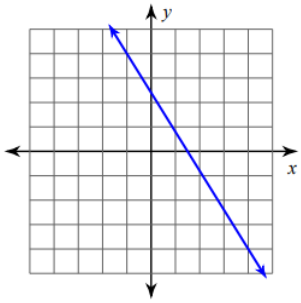

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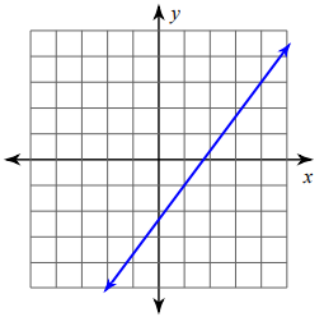

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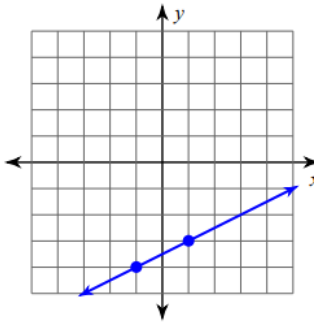

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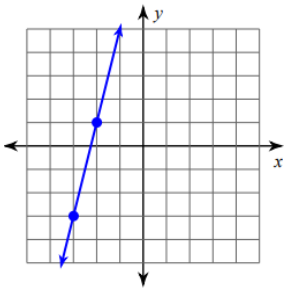


5. For each equation below, determine the slope and y-intercept of the line.
   a. $y = x + 2$
   b. $y = \frac{-2}{3}x + 4$
   c. $2x + 3y = 1$
   d. $x = 4$
   e. $y = -2$

6. On the graph paper, graph the following lines and curves.
   a. $y = 4x - 1$
   b. $y = \frac{7}{2}x - 2$
   c. $y = \frac{-5}{3}x$
   d. $2x - 3y = 1$
   e. $x - y = 3$
   f. $x = -4$

g. $y = 3$
h. $y > -x - 5$
i. $y \geq \frac{7}{4}x + 2$
j. $5x - 3y \leq -15$
k. $y = x^2 - 7x + 10$

7. Combine like terms:
   a. $-2x + 11 + 6x$
   b. $-5n + 3(6 + 7n)$
   c. $-9(6m - 3) + 6(1 + 4m)$
   d. $-3(10b + 10) + 5(b + 2)$
   e. $-4 + 7(1 - 3m)$

8. Solve for the unknown variable.
   a. $26 = 8 + v$
   b. $16 = \frac{x}{11}$
   c. $\frac{a}{4} + 2 = 6$
   d. $-1 = \frac{5+x}{6}$
   e. $144 = -12(x + 5)$
   f. $2(4x - 3) - 8 = 4 + 2x$
   g. $-(1 + 7x) - 6(-7 - x) = 36$
   h. $-5(1 - 5x) + 5(-8x - 2) = -4x - 8$

9. Solve the proportional equations:
   a. $\frac{10}{8} = \frac{n}{10}$
   b. $\frac{7}{b+5} = \frac{10}{5}$
   c. $\frac{4}{n+2} = \frac{7}{n}$
   d. $\frac{n}{n-3} = \frac{2}{3}$
   e. $\frac{5}{r-9} = \frac{8}{r+5}$

10. Factor completely.
    a. $b^2 + 8b + 7$
    b. $k^2 - 13k + 40$
    c. $2n^2 + 6n - 108$
    d. $5v^2 - 30v + 40$
    e. $5n^2 + 19n + 12$
    f. $7a^2 + 53a + 28$
    g. $-6a^2 - 25a - 25$
    h. $9x^2 - 1$
    i. $16n^2 - 9$
    j. $81 + 180x + 100x^2$
    k. $200m^4 + 80m^3 + 8m^2$
    l. $8r^3 - 64r^2 + 4 - 8$

11. Solve the equation for the unknown by factoring or using the quadratic formula.
    a. $k^2 = 76$
    b. $2n^2 = -144$
    c. $m^2 + 7 = 88$
    d. $(k + 1)(k - 5) = 0$
    e. $(2m + 3)(4m + 3) = 0$
    f. $n^2 - 10n + 22 = -2$
    g. $5r^2 - 44r + 120 = -30 + 11r$
    h. $m^2 - 5m - 14 = 0$
    i. $2x^2 - 7x - 13 = -10$
    j. $k^2 - 31 - 2k = -6 - 3k^2 - 2k$

12. Simplify the radical expressions below:
    a. $\sqrt{125n}$
    b. $\sqrt{80p^3}$
    c. $6\sqrt{72x^2}$
    d. $\sqrt{384x^4y^3}$

e. $3\sqrt{6} - 4\sqrt{6}$

f. $-11\sqrt{21} - 11\sqrt{21}$

g. $3\sqrt{3} - \sqrt{27}$

h. $3\sqrt{18} + 3\sqrt{12} + 2\sqrt{27}$

i. $-3\sqrt{45} + 2\sqrt{12} + 3\sqrt{6} - 3\sqrt{20}$

j. $3\sqrt{12} \cdot \sqrt{6}$

k. $\sqrt{20x^2} \cdot \sqrt{20x}$

l. $2\sqrt{5}(\sqrt{6} + 2)$

13. Simplify by rationalizing the denominator.

a. $\frac{4}{\sqrt{5}}$

b. $\frac{\sqrt{15}}{5\sqrt{20}}$

c. $\frac{\sqrt{6}}{\sqrt{24}}$

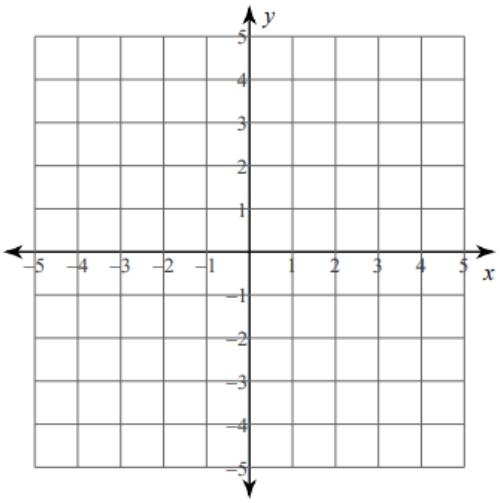
d. $\frac{\sqrt{2}}{2\sqrt{3}}$

14. Solve the system of equations by graphing:

a.

$$y = -\frac{5}{3}x + 3$$

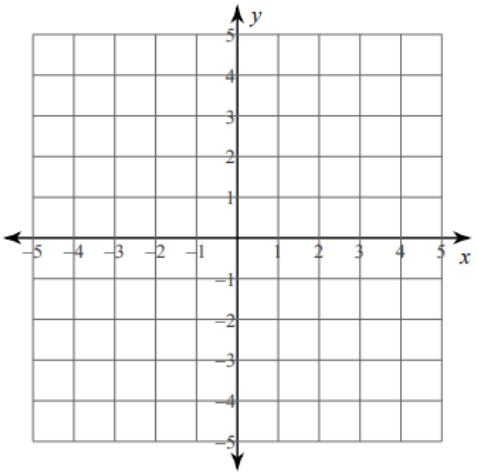
$$y = \frac{1}{3}x - 3$$



b.

$$y = -\frac{1}{2}x - 1$$

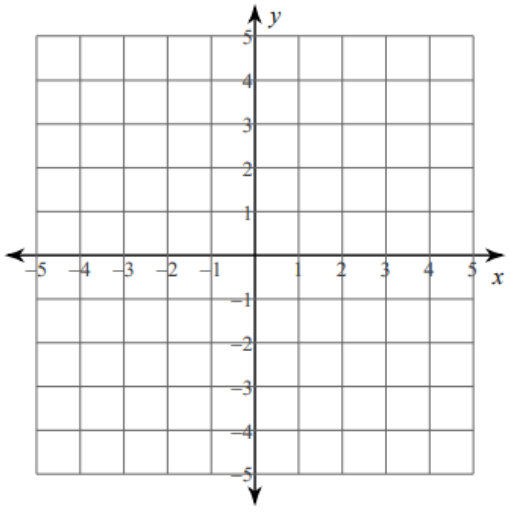
$$y = \frac{1}{4}x - 4$$



c.

$y = -1$

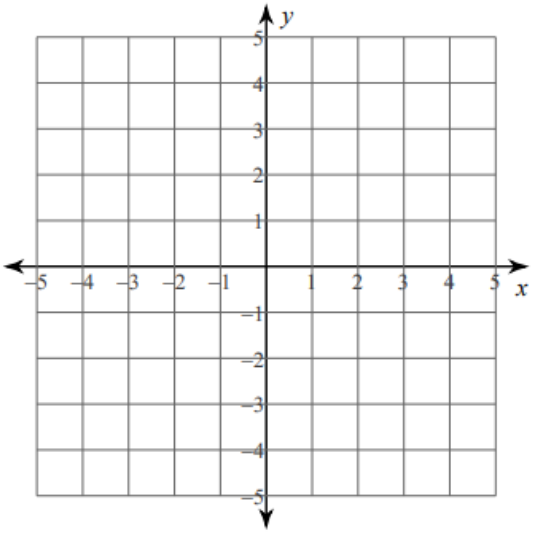
$y = -\frac{5}{2}x + 4$



d.

$y = 3x - 4$

$y = -\frac{1}{2}x + 3$



15. Solve the system of equations by substitution or elimination:

a. $y = 6x - 11$
$-2x - 3y = -7$

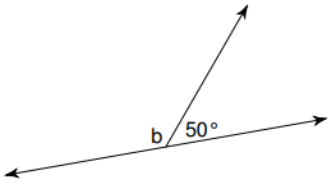
b. $8x + y = -16$
$-3x + y = -5$

c. $x - y = 11$
$2x + y = 19$

d. $-7x + y = -19$
$-2x + 3y = -19$

16. Find the measure of angle b.

a.



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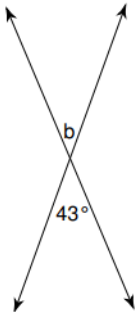

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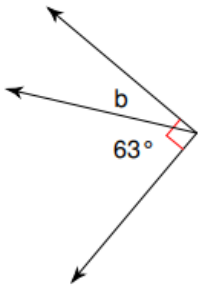

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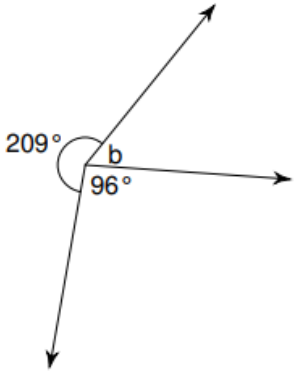

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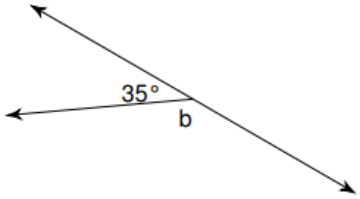

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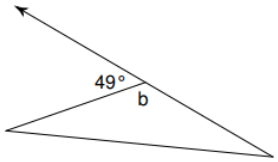
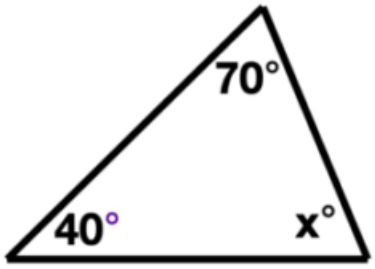


17. Solve for the unknown variable in each triangle below:

a.



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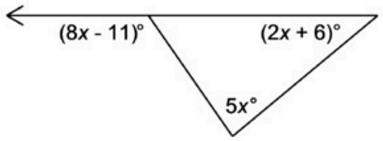

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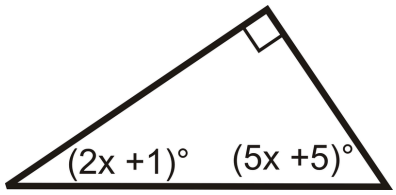
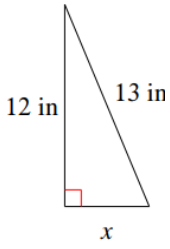


18. Solve for the unknown side length in the triangles using the Pythagorean Theorem.

a.



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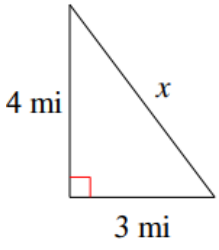

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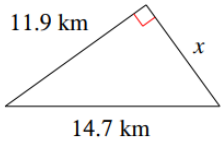

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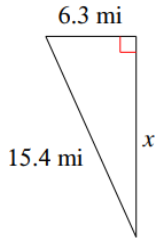

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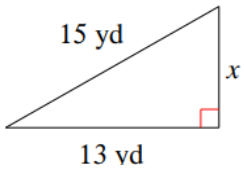

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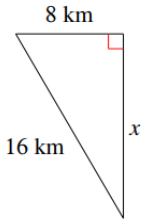
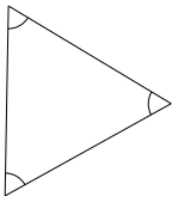


19. Classify each shape below.

a.



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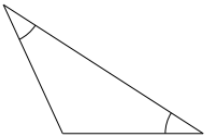

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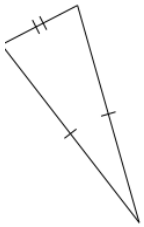

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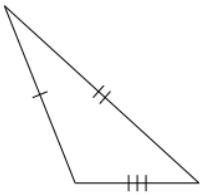

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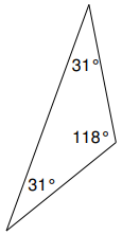

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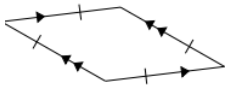

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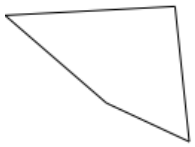

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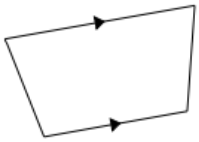

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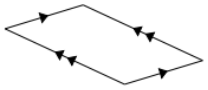

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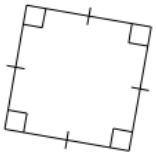
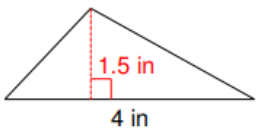


20. Calculate the area of each shape below.

a.

b.



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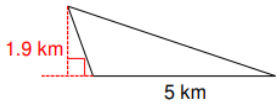

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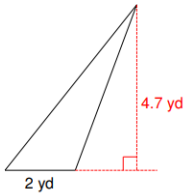

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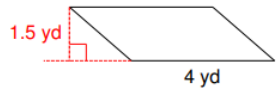

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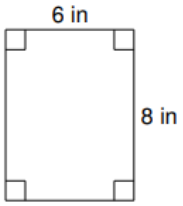

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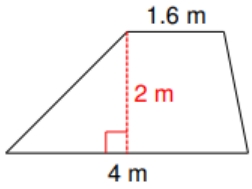

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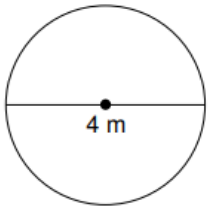
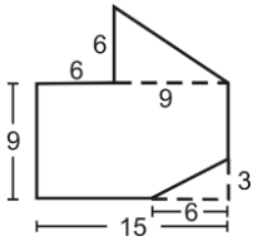


21. Find the area and perimeter of each shape below.

a.



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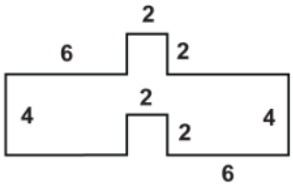

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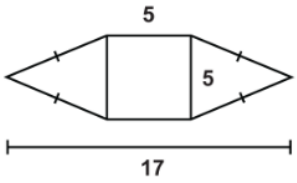


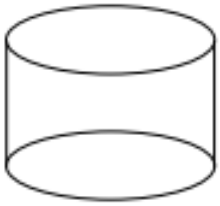
22. Name the three-dimensional solids below.

a

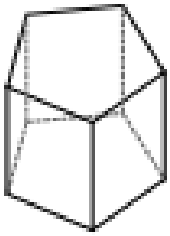
b.

c

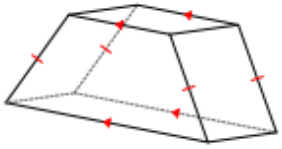
d



e

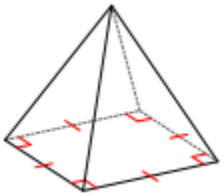


f



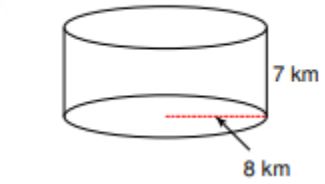
g

h

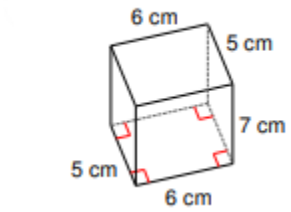


23. Calculate the volume of the solids below.

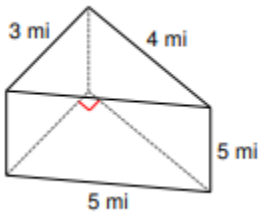
a.



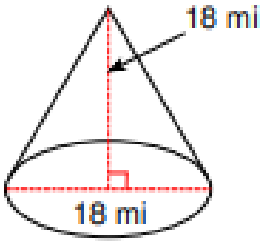
b.



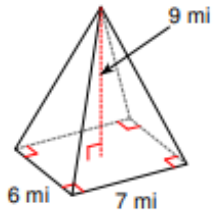
c.



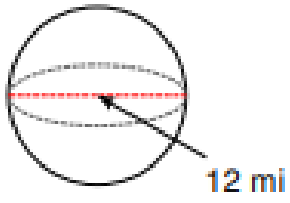
d.



e.

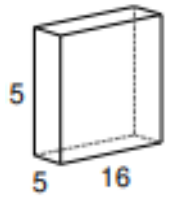


f.

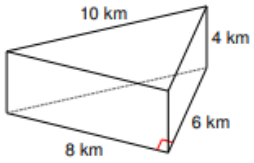


24. Calculate the surface area of the solids below.

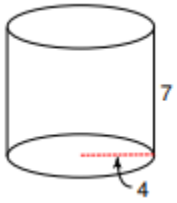
a.



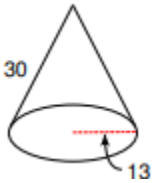
b



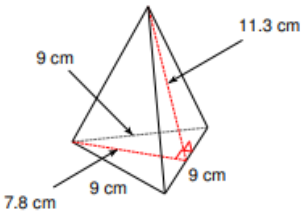
c



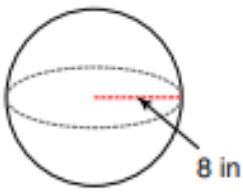
d



e

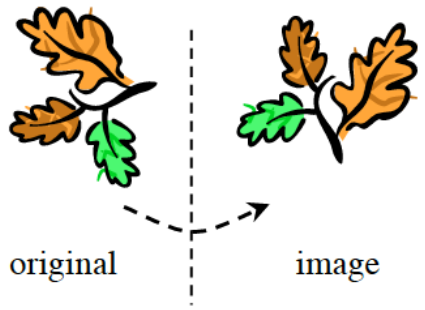


f

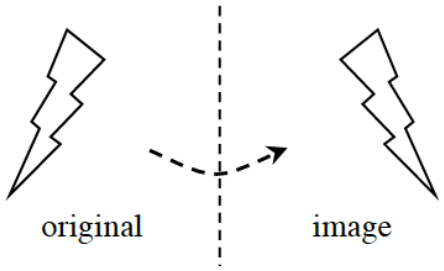


25. Identify the transformations below as a translation, reflection, rotation, or dilation.

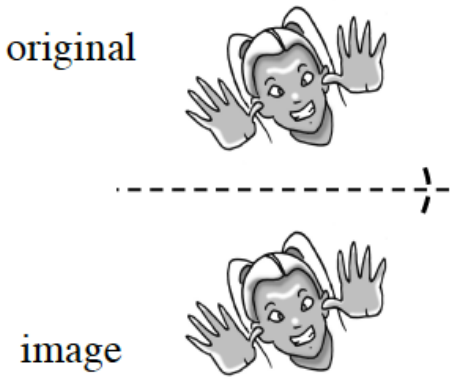
a.



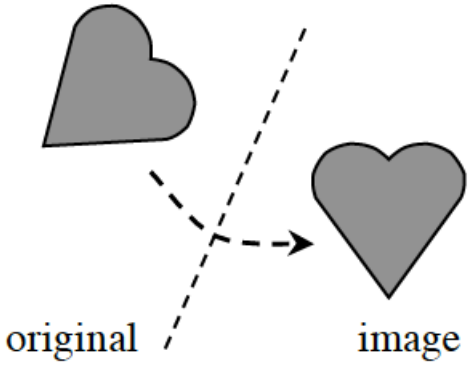
b.



c.

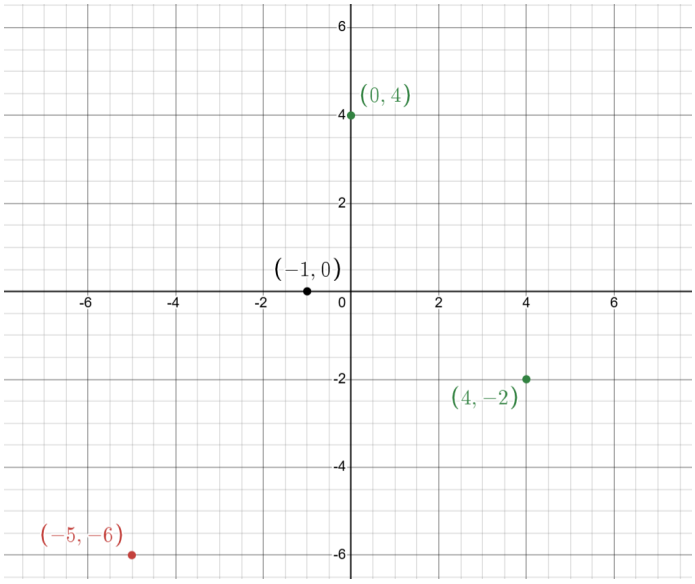


d.



ANSWER KEY

1



2
a. -1/26
b. 26/3
c. 11/2
d. -2

3
a. √677
b. √685
c. 5√5
d. 10√5

4
a. Zero
b. Undefined
c. -3/2
d. 4/3
e. 1/2
f. 4

5

a.	Slope: 1	y intercept: 2
b.	Slope: -2/3	y intercept: 4
c.	Slope: -2/3	y intercept: 1/3
d.	Slope: undefined	y intercept: none
e.	Slope: zero	y intercept: -2

6 Click this link to see the graphs

7 a. 4x + 11

b. 16n + 18
c. 33 - 30m
d. -25b - 20
e. 3 - 21m

8 a. v = 18
b. x = 176
c. a = 16
d. x = -11
e. x = -17
f. x = 3
g. x = 5
h. x = -7/11

9 a. n = 12.5
b. b = -1.5
c. n = -14/3
d. n = -6
e. r = 97/3

10 a. (b + 1)(b + 7)
b. (k - 8)(k - 5)
c. 2(n - 6)(n + 9)
d. 5(v - 4)(v - 2)
e. (n + 3)(5n + 4)
f. (a + 7)(7a + 4)
g. -(2a + 5)(3a + 5)
h. (3x - 1)(3x + 1)
i. (4n - 3)(4n + 3)
j. (10x + 9)^2
k. $8m^2(5m + 1)^2$
l. $4(2r^3 - 16r^2 - 1)$

11 a. $k = \pm 2\sqrt{19}$
b. $n = \pm 6\sqrt{2}i$
c. m = ±9
d. k = -1, 5
e. m = -3/2, -3/4
f. n = 4, 6
g. r = 5, 6
h. m = -2, 7
i. $x = (7 \pm \sqrt{73})/4$
j. k = ±5/2

12

a. $5\sqrt{5n}$
b. $4p\sqrt{5p}$
c. $36x\sqrt{2x}$
d. $8x^2y\sqrt{6y}$
e. $-\sqrt{6}$
f. $-22\sqrt{21}$
g. 0
h. $9\sqrt{2}+12\sqrt{3}$
i. $-15\sqrt{5}+4\sqrt{3}+3\sqrt{6}$
j. $18\sqrt{2}$
k. $20x\sqrt{x}$
l. $2\sqrt{30}+4\sqrt{5}$

13

a. $\frac{4\sqrt{5}}{5}$
b. $\frac{\sqrt{3}}{10}$
c. $\frac{1}{2}$
d. $\frac{\sqrt{6}}{6}$

14

a. (3,-2)
b. (4,-3)
c. (2,-1)
d. (2,2)

15

a. (2,1)
b. (-1,-8)
c. (2,-5)

16

a. b=130°
b. b=43°
c. b=27°
d. b=55°
e. b=145°
f. b=131°

17

a. x=70
b. x=17
c. x=12

18

a. x=5
b. x=5
c. x=8.63

d. x=14.05
e. x=7.48
f. x=13.85

19 a. Equilateral triangle
b. Isosceles triangle
c. isosceles triangle
d. Scalene triangle
e. Isosceles triangle
f. Rhombus
g. Quadrilateral
h. Trapezoid
i. Parallelogram
j. square

20
a. 18
b. 3
c. 4.75
d. 4.7
e. 6
f. 48
g. 5.6
h. 12.56

21
a. 153
b. 52
c. 55

22
a. Sphere
b. Triangular pyramid
c. Cone
d. Cylinder
e. Pentagonal prism (or pentagon-based prism)
f. Trapezoidal prism (or trapezoid-based prism)
g. Pentagonall pyramid (or pentagon-based pyramid)
h. Square-based pyramid

23
a. 1407.43
b. 210
c. 30
d. 1526.81
e. 126
f. 904.78

24
a. 370
b. 240
c. 276.46

d. 1756.26 (Hint: use the Pythagorean Theorem to find the height)
e. 187.65
f. 804.25

25

a. Rotation
b. Reflection
c. Translation
d. rotation