

- Which of the following expressions is equal to: $2x + 5xy - 10$
 - $2x - 5xy + 10$
 - $5xy + 5x - 10 - 3x$
 - $5xy + 5x - 10 + 3x$
 - $7xy - 10$

2. Simplify: $-5a^2b^3 + 4a^3b^2 - 6a^3b^2 + 7a^2b^3$

- In January, Eugenie texted 50 more messages than $\frac{4}{5}$ of the messages in December. How many messages did she text in January? (Give the answer as an expression)

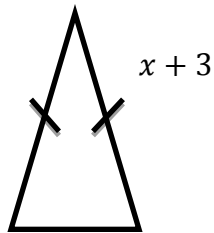
Hint: let the # of text messages in Dec. = a variable

4.  = x^2  = $-x^2$  = x  = $-x$  = 1  = -1

Solve the following modelled expression using models AND an equation.

(  ) - (  )

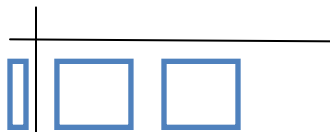
- Find the missing length.
Perimeter = $5x + 2$



- Complete the following model and write the multiplication statement for it.



- Complete the following model and write the division statement for it.



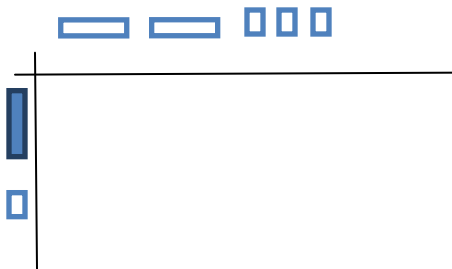
8. Simplify.

$$(2m)(3m^2) + \frac{5n^2}{n}$$

9. Find the error:

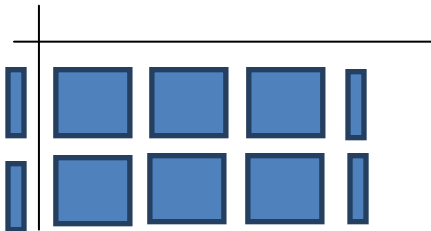
$$\begin{aligned} (6e)(3) - (2f - e) &= 18e - 2f - e \\ &= 17e - 2f \end{aligned}$$

10. Complete the following model, and then write the multiplication statement. (Make sure to simplify your answer!)



11. Simplify: $2x(3x + 10)$

12. Complete the following model, and then write the division statement. (Show all steps.)



13. Simplify: $7a(4b - 3a) + \frac{6x^2 + x}{2}$

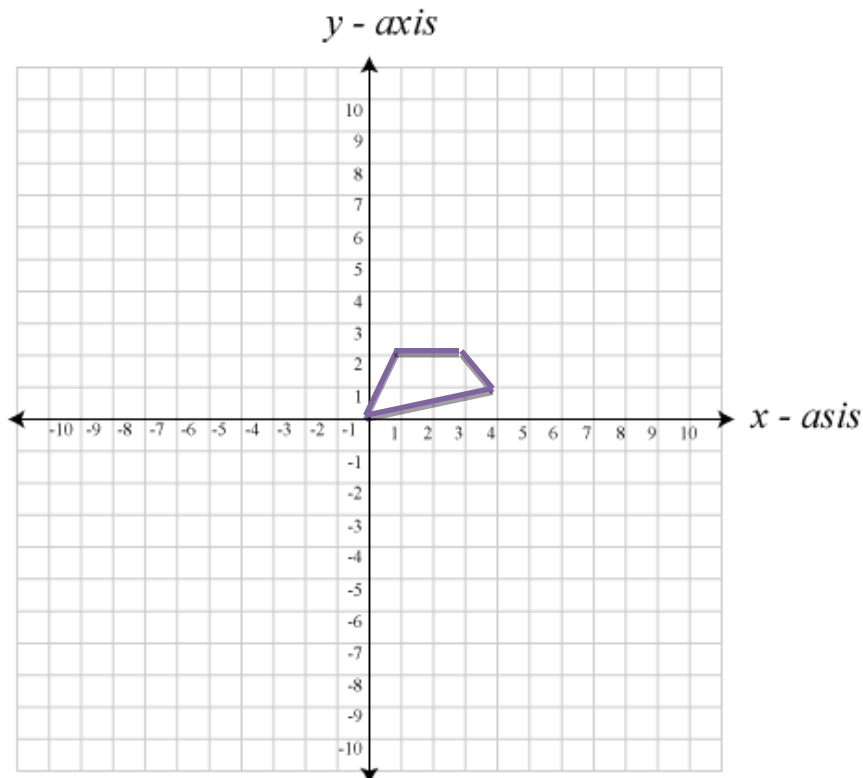
14. Fill in the blanks:

- A triangle with 3 lines of symmetry is a(n) _____ triangle.
- A triangle with only 1 line of symmetry is a(n) _____ triangle.
- A triangle with NO line symmetry is a(n) _____ triangle.

15. How many lines of symmetry does the following shape have (show all lines of symmetry):

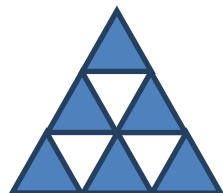


16. Reflect the following shape over the x AND y axes.



17. Create a design that demonstrates line symmetry.

18. Does the following shape have rotation symmetry? If so, write the ORDER and ANGLE of rotation.



19. Find the order of rotation for the following shapes:

a)



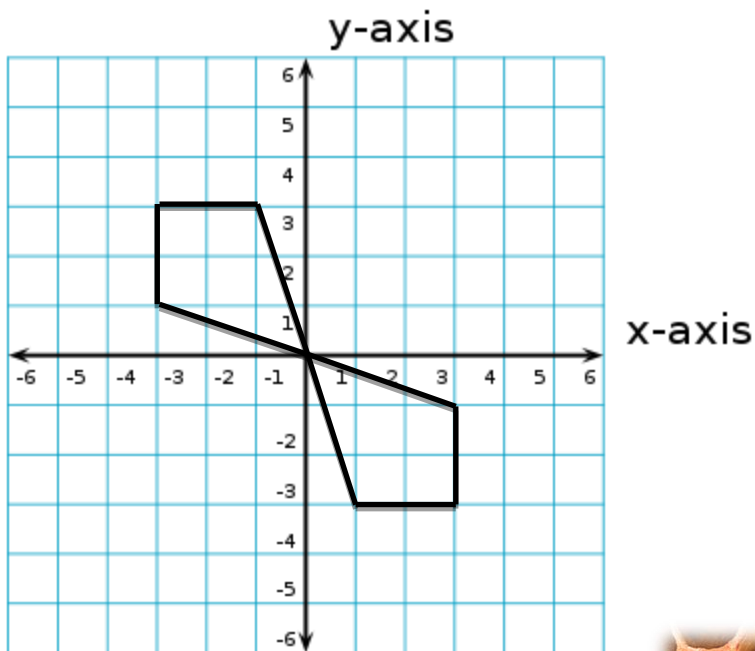
b)



20. From the previous question, state the ANGLE of rotation. (Question 19, a)b)

21. Create a design with rotation symmetry.

22. Identify any line symmetry or rotation symmetry in the following diagram.



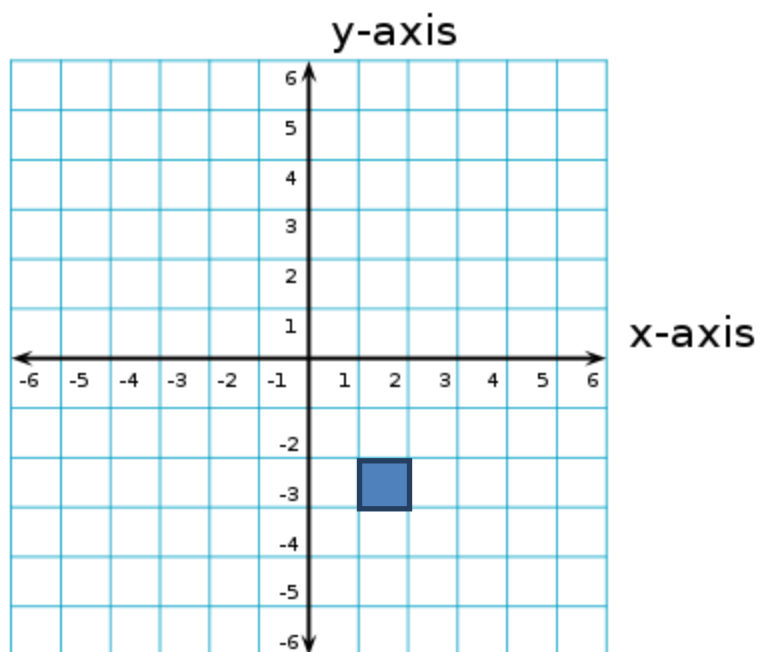
23. Visualize a honeycomb... explain why there is line/rotation symmetry.



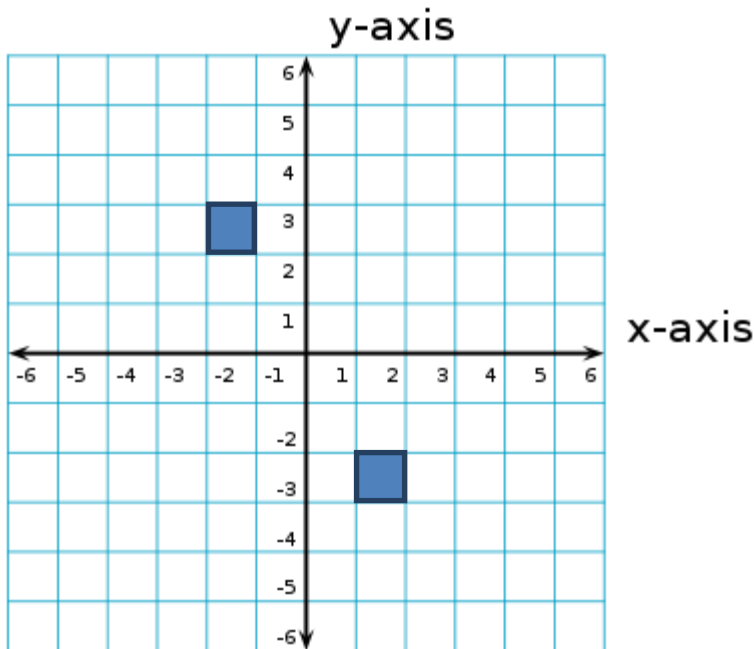
24. Identify and describe the types of symmetry created in the following tessellation.



25. Translate 4 left, 4 up. Record the new coordinates, then state if any line/rotation symmetry occurs.



26. State which type(s) of symmetry shows. Show all work.



27. Explain why question 25 does not have rotation symmetry.

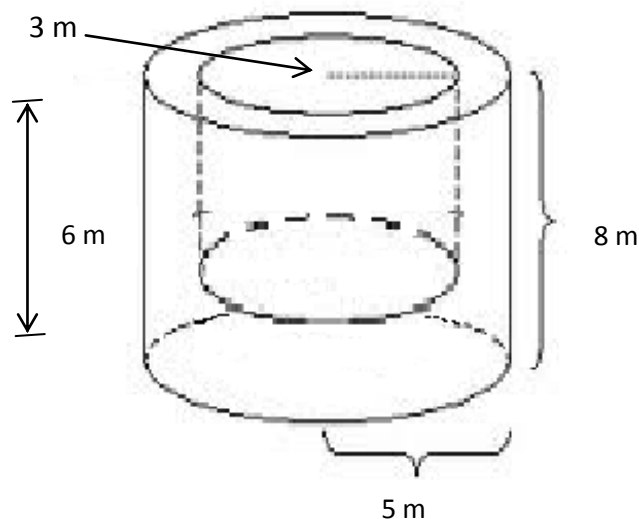
28. A perfectly-shaped cone with radius 5 m and slant length 8 m is placed on top of a cube with side length 8m. Draw a diagram, and then find the area of overlap.

29. Find the total surface area for the object in question 28.

Given: $SA \text{ of a cone} = \pi r^2 + \pi r s$ where r is the radius and s is the slant length.

30. Helen wants to paint the following container blue. However, she wants to keep the bottom unpainted. She also needs to paint 2 layers or else the container will not look as good.

What is the total amount of paint needed to paint the container? Express your answer in terms of π .



ANSWER KEY:

1. B

2. $2a^2b^3 - 2a^3b^2$

3. Let the # of text messages in Dec = t $\frac{4t}{5} + 50$

4.



$$\begin{aligned} : (3x^2 - x + 4) - (x^2 - x + 2) &= 3x^2 - x + 4 - x^2 + x - 2 \\ &= 2x^2 + 2 \end{aligned}$$

5. $3x - 4$

6. $(-2)(-3x) = 6x$

7. $\frac{-2x^2}{-x} = 2x$

8. $6m^3 + 5n$

9. $= 18e - 2f + e = 19e - 2f$

10. $(x - 1)(2x - 3) = -2x^2 - 3x + 2x + 3 = -2x^2 - x + 3$

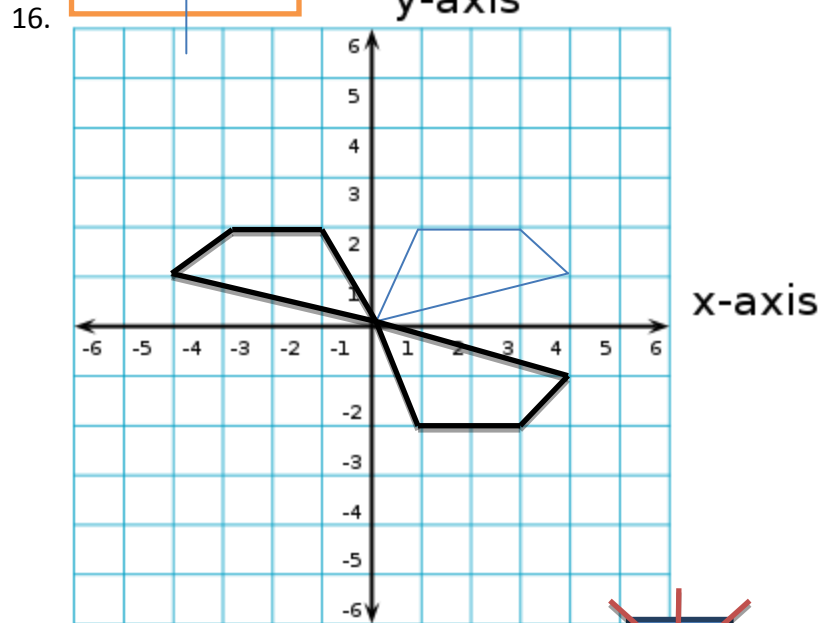


11. $6x^2 + 20x$

12. $\frac{6x^2+2x}{2x} = 3x + 1$

13. $28ab - 21a^2 + 3x^2 + \frac{x}{2} = -21a^2 + 28ab + 3x^2 + \frac{x}{2}$

14. equilateral, isosceles, scalene



17. ANSWERS MAY VARY. Example: a square

A diagram of a blue square with red lines representing its lines of symmetry. There are four red lines: a vertical line, a horizontal line, and two diagonal lines, all intersecting at the center of the square.

18. Order 3
 $\frac{360}{3} = 120^\circ$

19. a) 8 b) 2

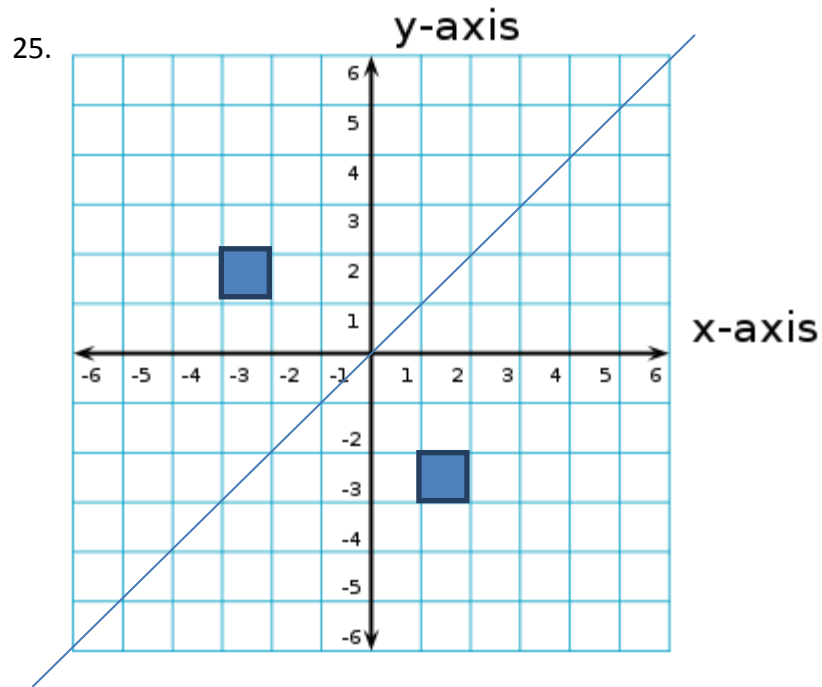
20. a) $\frac{360}{8} = 45^\circ$ b) $\frac{360}{2} = 180^\circ$

21. ANSWERS MAY VARY. For example, a square would have order 4, a 90° rotation.

22. - Diagonal line symmetry
 - Order 2 rotation (180°)

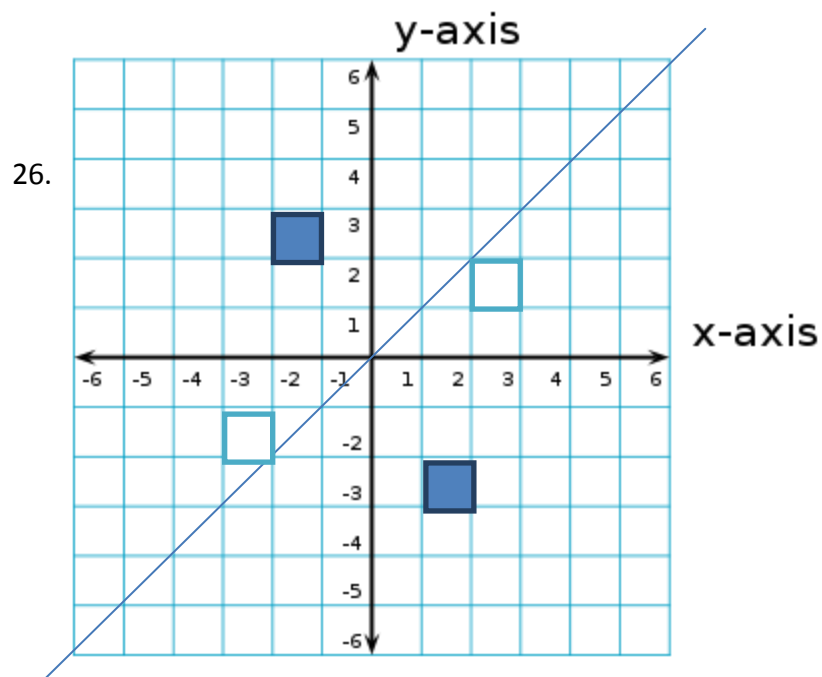
23. They are similar to regular hexagons placed beside each other. Regular hexagons by themselves have 6 lines of symmetry and rotational symmetry of order 6. (60°)

24. Rotation symmetry



$A' (-3,2)$ $B' (-2,2)$ $C' (-3,1)$ $D' (-2,1)$

LINE SYMMETRY ONLY



Line symmetry AND rotation symmetry order 2 (180°)

27. When rotated, the image will not go directly on top of the original shape.

28. The area of overlap is the area of the circle: $A = \pi r^2$

$$\pi(5)^2 = 25\pi \approx 78.54 \text{ m}^2$$

29. Area of the cube = $(8^2)(6) = (64)(6) = 384\text{m}^2$

Remember to subtract the overlap circle! 78.54m^2

Therefore, the only area left to find is the cone subtract the base.

$$\pi r s = \pi(5)(8) = 40\pi \approx 125.67\text{m}^2$$

TOTAL SA $\approx (384\text{m}^2 - 78.54\text{m}^2) + 125.67\text{m}^2 \approx 305.46\text{m}^2 + 125.67\text{m}^2 \approx 431.13\text{m}^2$

30. Outside cylinder area (body of container) : $(2\pi r)(\text{height}) = (2\pi 5)(8) = 10\pi(8) = 80\pi \text{ m}^2$

Inside cylinder area (body of container) : $(2\pi r)(\text{height}) = (2\pi 3)(6) = 6\pi(6) = 36\pi \text{ m}^2$

Base area DOES NOT need to be calculated.

Top + inside base areas = base area = $\pi r^2 = \pi(5)^2 = 25\pi \text{ m}^2$

TOTAL SA = $80\pi + 36\pi + 25\pi = 141\pi$

2 layers of paint = $2(141\pi) = 282\pi \text{ m}^2$