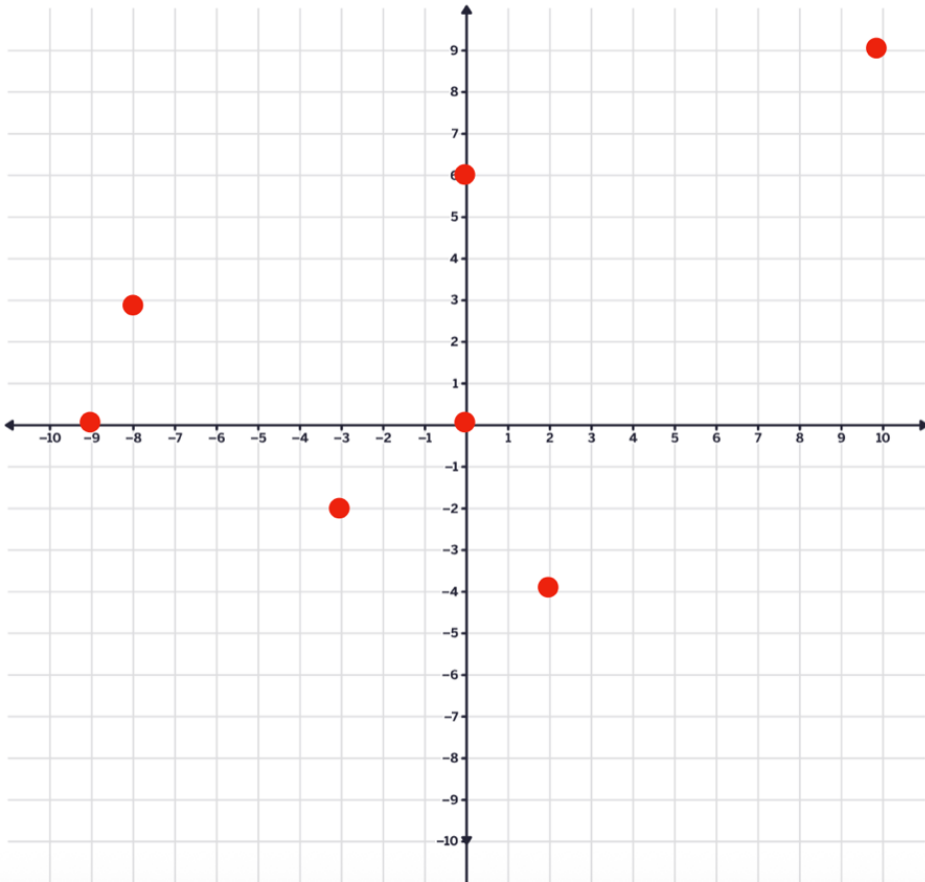




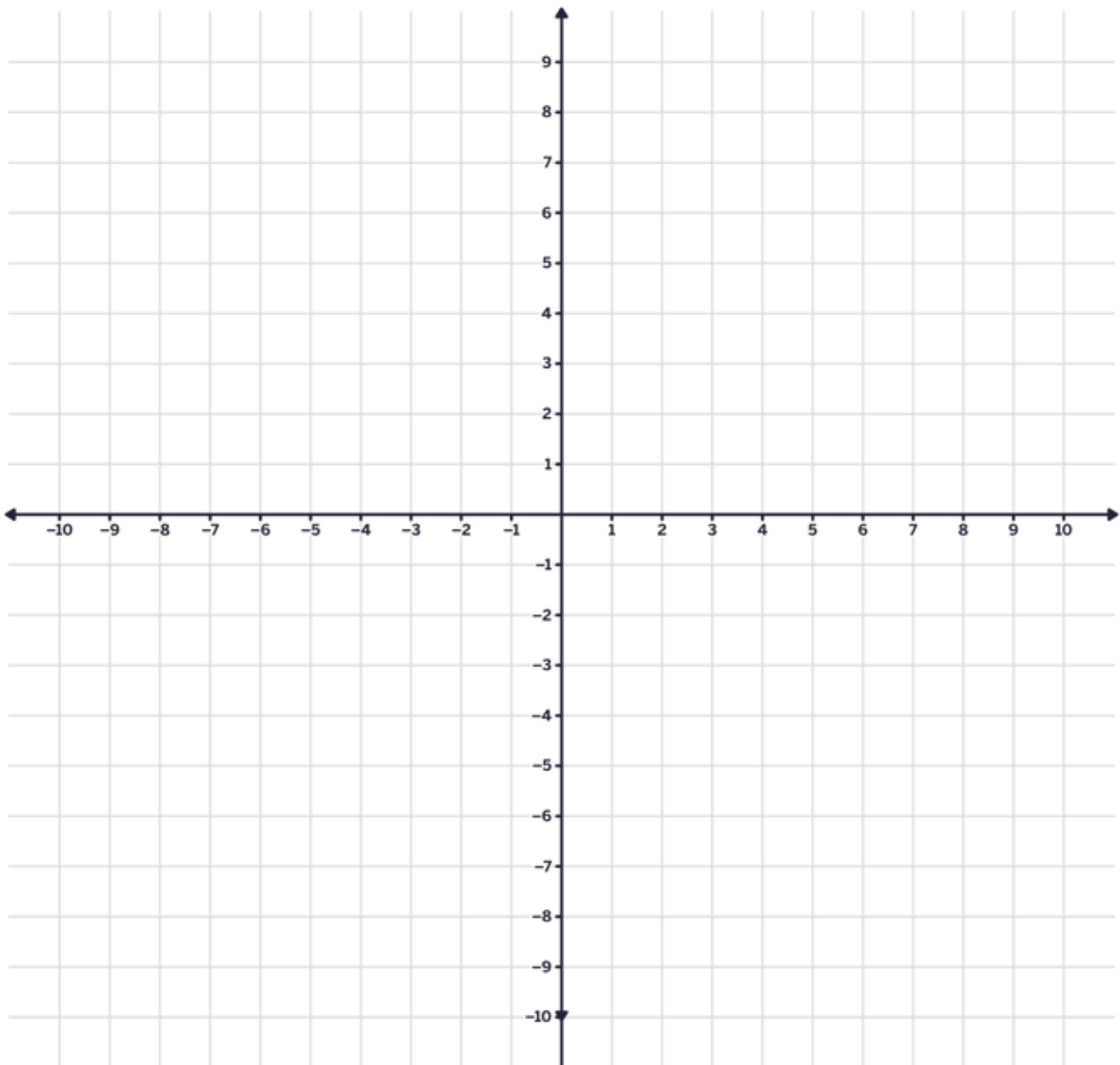
1. What are the coordinates for each point on the Cartesian Plane shown? Label each ordered pair on the graph.





2. Plot the following points (ordered pairs) on the Cartesian Plane.

- a) $(-3, 4)$
- b) $(0, 0)$
- c) $(-6, -5)$
- d) $(7, 8)$
- e) $(1, -2)$



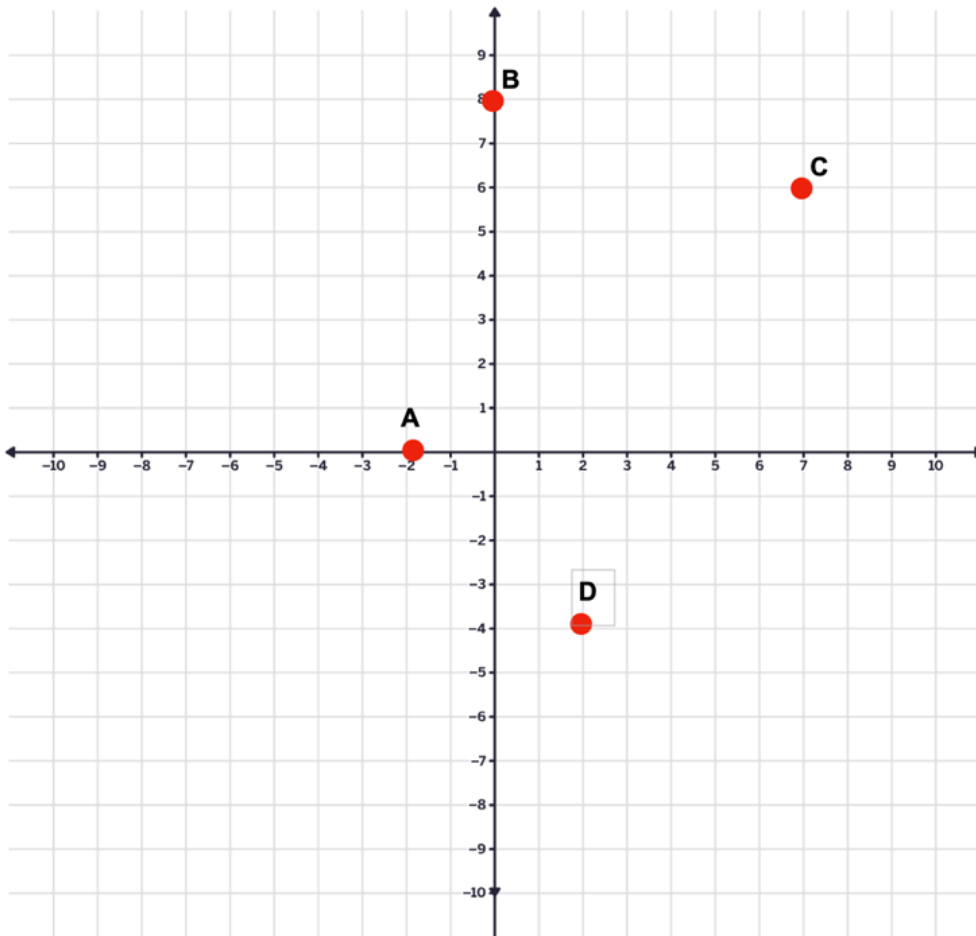
3. Which letter on the graph matches each ordered pair.

$(-4, -2)$

$(7, 6)$

$(0, 8)$

$(-2, 0)$



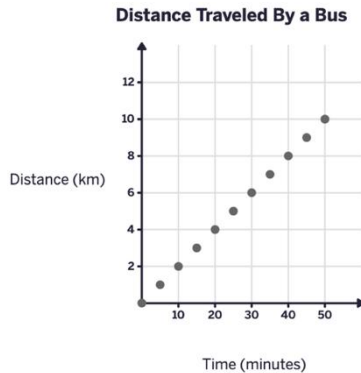


4. Predict in which quadrant each of the following points will lie. Then plot them on the Cartesian plane. Were your predictions correct?

- a) (4, 3) Quadrant _____
- b) (-5, 2) Quadrant _____
- c) (-3, -4) Quadrant _____
- d) (6, -1) Quadrant _____
- e) (0, 5) Quadrant _____
- f) (-7, 0) Quadrant _____

5.

Time (minutes)	Distance (km)
0	0
5	1
10	2
15	3
20	4
25	5
30	6
35	7
40	8
45	9
50	10



- a) According to this graph, how long does it take the local bus to drive 3km?
- b) How long did it take for the bus to complete its entire route?
- c) What was the total distance travelled during the bus's trip?
- d) In which quadrant of the Cartesian Plan is the graph? Why?

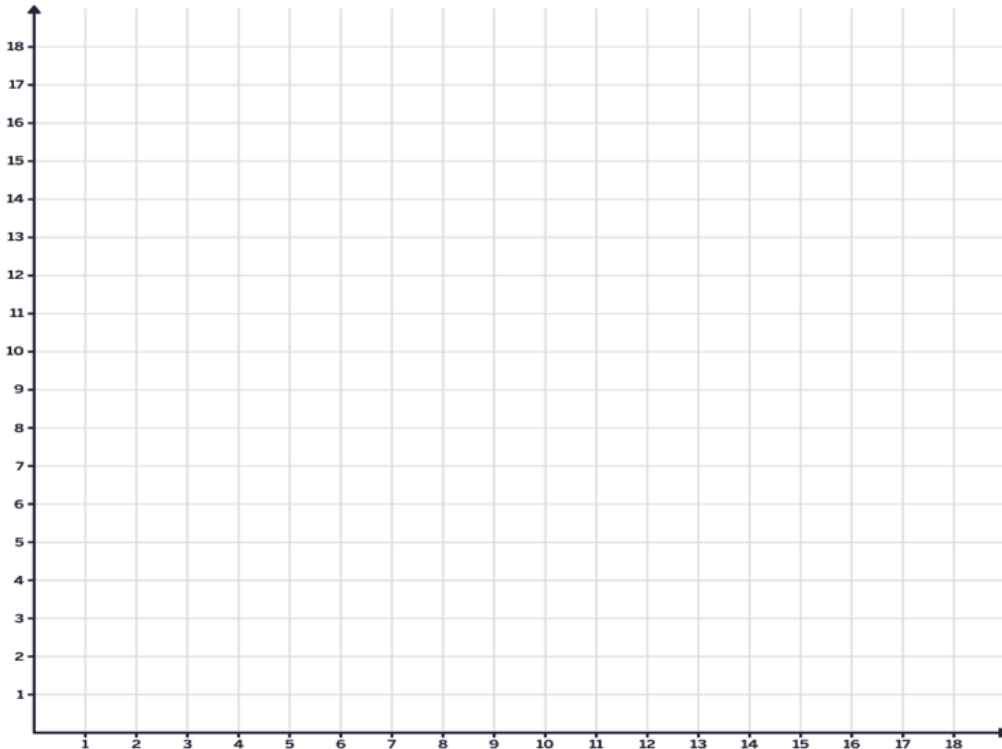


6. A taxi company charges \$3.50 to start the ride and 1.25 for every kilometer travelled.

Complete the table of values showing the total cost for these distances:

DISTANCE (km)	COST (\$)
0	
2	
4	
6	

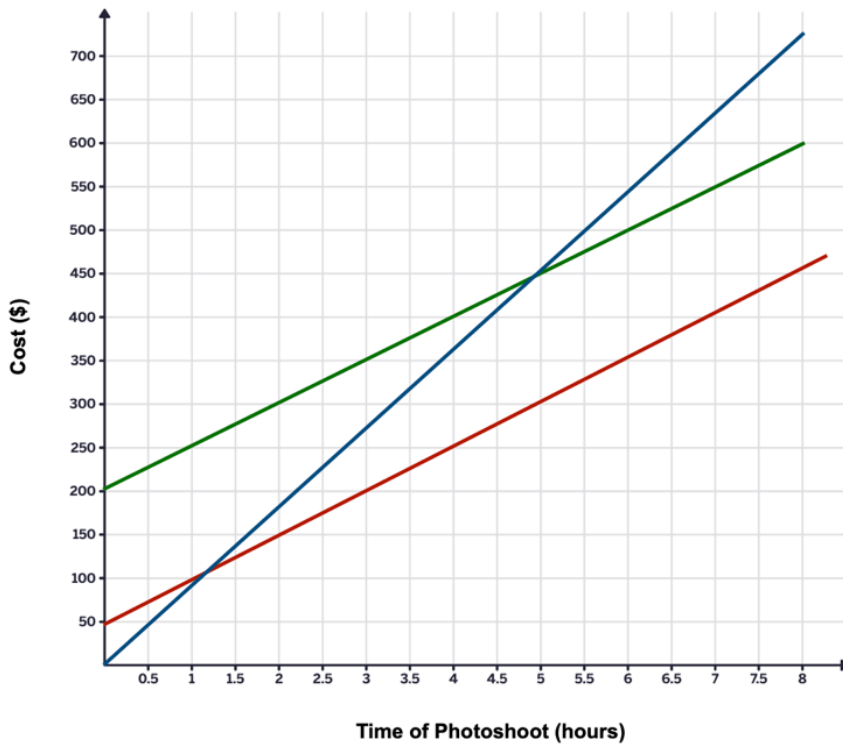
- a) Use your table to create a graph of Cost (\$) on the y-axis and distance (km) on the x-axis.
- b) Draw a straight line through the points.
- c) What is cost for 5km?
- d) At what distance does the cost reach \$10?





7. Which line in the graph best describes the relationship of a photographer charging \$50 per hour for a photo session plus an additional \$200 for editing and printing costs?

Photoshoot Charges



8. Create a polygon with vertices on the Cartesian Plane. Label the vertices with capital letters and identify their ordered pairs.



9. Dosaj has a bank account with \$250 in it. He has a paper route job and deposits \$50 of his earnings into his account at the end of every month.
- Create a table of values that represents how much money is in Dosaj's account each month for a year.
 - Draw a graph that represents this data.
 - Use the graph to tell how long it will take Dosaj to have \$400 in his account.
 - Predict how long it will take Dosaj to have \$1000 in his account, if he doesn't spend any money.



3. The Wave Swinger (the classic ride at Playland) has a radius of about 4.18m. Find the circumference (the distance traveled by a swing seat in one full rotation around the ride's centre).

4. A circle has a circumference of 23.55cm. About how far is a point on the circle from the centre?

5. A bicycle wheel has a radius of 35cm.

a) What is the diameter of the wheel?

b) If the wheel turns 40 revolutions, how far would the bike travel?



6. While Luca was on vacation, he stayed at a hotel with a circular swimming pool with a diameter of 15 m. A fence around the pool costs \$90 per meter to build. How much did the fence cost?

7. Find the area of a circle with the given dimension:

a) a radius of 2.5m

b) a diameter of 11km



8. A circular outdoor rink has an area of 510m^2 . What is the diameter of the rink, to the nearest tenth of a meter?

9. The Canadian toonie has two parts:

- an outer ring (made of nickel plating)
- an inner circle with a diameter of 16mm (made of brass)

What is the area of the outer ring, rounded to the nearest hundredth of a square millimeter?



10. Construct a circle with these measurements:

a) a radius of 6cm

b) a diameter of 9cm

a) a circumference of 25cm



11. What patterns do you notice when you compare the circumference and diameter of different circles. Explain and justify your thinking using pictures, symbols and words.

12. How can you estimate the circumference of a circle without using the formula? What strategies might work?



13. If you double the diameter of a circle, what happens to the circumference? How can you show this in more than one way?

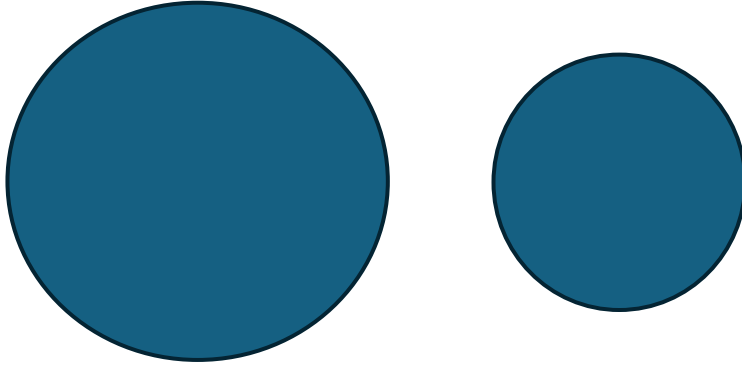
14. If two circles have the same circumference, do they have the same area? Why? Show your thinking using math.



15. Describe a situation in which you might want to estimate either the circumference or the area of a circle but would not want to calculate it exactly.

16. A circle has a radius of 10cm. Is it possible to create a rectangle with the same perimeter and a ratio of width to perimeter of about 1 to 10? If so, what are those measurements? Show your thinking.

17. You want to compare the circumferences of these two circles. What unit and what tool would you use? Why?





TASK: Design a geometric pattern using overlapping circles of different diameters.

Materials Needed

- Compass
- Pencil
- Eraser
- Blank or graph paper
- String for measuring distance around the circle

Include the Following

- At least six circles
- Include the following circle sizes
 - 8cm (large), 6cm (medium), 4cm (small)
- Circles must overlap with at least one other circle

Steps

- Draw the largest circle near the centre of your paper.
- Add the medium-sized circles so they overlap with the large circle.
- Fill gaps with smaller circles, making sure they overlap with others.
- Add other shapes to your design, if you like.
- Use colour or shading to enhance your design.



1. Sofia flipped two coins and recorded whether she got heads or tails. She did this 20 times and her results were:

(HH), (HT), (TH), (TT), (HT), (HH), (TH), (HT), (TT), (HH), (HT), (TH), (HT), (HH), (TT), (HT), (HH), (TH), (HT), (TT).

What was the experimental probability that Sofia got two heads?

2. Ethan drew two cards from a shuffled deck (with replacement) 20 times and recorded the suits in a table.

His results were:

♥♣, ♦♠, ♥♥, ♠♠, ♦♥, ♥♦, ♣♣, ♥♠, ♦♦, ♥♥, ♠♥, ♦♣, ♥♣, ♠♠, ♦♥, ♥♦, ♣♠, ♥♥, ♦♠, ♥♣.

What was the experimental probability that Ethan drew two hearts?



3. Leo spun two spinners (each divided into 4 equal sections (orange, green, pink, blue) 15 times and recorded the results in a table:
(Orange–Green), (Pink–Blue), (Blue–Blue), (Green–Orange), (Orange–Orange), (Pink–Pink), (Green–Green), (Blue–Orange), (Orange–Pink), (Green–Blue), (Pink–Orange), (Blue–Green), (Orange–Orange), (Green–Pink), (Pink–Blue)
What was the experimental probability that both spinners landed on the same colour?

4. Rafa drew two marbles from a bag (with replacement) 20 times. The bag had 3 red, 2 blue, and 1 green marble.
Her recorded results were: (R-B), (G-R), (R-R), (B-B), (R-G), (B-R), (R-R), (G-G), (R-B), (B-G), (R-R), (G-R), (B-B), (R-G), (R-R), (B-R), (G-G), (R-B), (B-G), (R-R).
What was the experimental probability that she drew two red marbles?



5. Arjun flipped a coin and rolled a die 9 times and recorded the results in a table:

(H-3), (T-6), (H-2), (H-5,) (T-4), (H-1), (T-2), (H-6), (T-3).

What was the experimental probability that he got heads and an even number?



6. Flip a coin and roll a die 20 times. Record each outcome in a table. Count how many times you got HEADS and an EVEN NUMBER. Calculate the experimental probability.



7. Flip a coin and role a die 100 times. Record each outcome in a table. Count how many times you got HEADS and an EVEN NUMBER. Calculate the experimental probability.



8. Choose any two tools (dice, coins, spinners, cards, marbles) and design your own experiment with 30 trials. Record your results and calculate the experimental probability for a specific event.



9. Roll two ten-sided dice 100 times and record the results.

Calculate the experimental probability of rolling a sum of 11.

Calculate the theoretical probability.

How do your results compare to the theoretical probability? Why do you think this is?

1. Show how to find each amount using mental math.

50% of 66	25% of 32
10% of 15	1% of 170

2. Use mental math to determine the amount. Show your thinking using pictures and numbers.

a) 60% of 50

b) 35% of 240

3. Calculate the total cost (final price).

a) A concert ticket costs \$250 plus GST.

b) Noah buys a bike for \$350 with a 15% discount and pays GST and PST.

c) Mia buys two hoodies for \$98 each and pays GST.

4. Calculate.

a) 37% of 485

b) 68% of 942



5. Determine the original price.

a) A backpack is on sale for \$45 after a 10% discount.

b) Final price of a fridge was \$1200 after a 30% discount.

6. What is the total amount paid for a restaurant bill of \$175, if a tip of 20% was provided.

7. If GST increased to 7%, how would that affect the total price of a \$100 item?
8. Which is better, 20% off or \$20 off on a \$150 item. Explain and justify your thinking.
9. Show two ways to estimate the total cost of an item with tax and discount.
10. Name an item that you have on your wish list. Find the current price of it and calculate what the final cost after taxes would be if it were on sale for 20% off.



1.

Marc has a budget of \$850 to refurbish and decorate a bedroom. He has to purchase a bed, bedding, a shelf and some storage organizers for the shelf. The items he selected are shown below. Will he have enough money to pay for these items, inclusive of tax? Show your thinking, and justify your answer.



bed
\$450



shelf
\$300



storage organizers
\$125.75



2. What is the total cost of four tires that sell for \$275 each, plus 5% GST and a fixed fee of \$6.50 per tire for an Eco Fee? You do not have to pay for PST because you are planning on mounting these tires on your car, yourself.

3. The selling price of a gaming console is about 35% more than it costs, at a store. It is currently sold at a discount of 15% off the selling price. How much does the store still gain?



4. In 2021, Richmond BC's population was 209, 937 and Kelowna BC's population was 144, 576. Over the next two years:

- Richmond's population grew by 6% in the first year, then 4% in the second year.
- Kelowna's population grew by a total of 10% across the same two years.

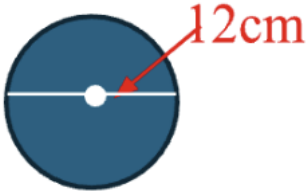
Did the population of each city increase by the same amount? Explain using math. What is the new population of each city after two years (round to the nearest whole number)?



5. Paco saved \$1250 over the year from a part time job. He decided to take \$850 of it to the bank to put in a savings account where it will earn 2% interest every month. How much will be in his account after three months if he doesn't withdraw any money?

6. You bought shoes at 40% off and a jacket at 20% off and paid the same amount for each. How would you figure out the original prices?

1. Estimate the circumference of a circle that has a diameter of 12cm. Show your thinking.



2. The diameter of a regulation basketball hoop (rim) is 45.72cm.

a) What is the radius?

b) Calculate the circumference



3. The Wave Swinger (the classic ride at Playland) has a radius of about 4.18m. Find the circumference (the distance traveled by a swing seat in one full rotation around the ride's centre).
4. A circle has a circumference of 23.55cm. About how far is a point on the circle from the centre?
5. A bicycle wheel has a radius of 35cm.
- What is the diameter of the wheel?
 - If the wheel turns 40 revolutions, how far would the bike travel?



6. While Luca was on vacation, he stayed at a hotel with a circular swimming pool with a diameter of 15 m. A fence around the pool costs \$90 per meter to build. How much did the fence cost?

7. Find the area of a circle with the given dimension:

a) a radius of 2.5m

b) a diameter of 11km



8. A circular outdoor rink has an area of 510m^2 . What is the diameter of the rink, to the nearest tenth of a meter?

9. The Canadian toonie has two parts:

- an outer ring (made of nickel plating)
- an inner circle with a diameter of 16mm (made of brass)

What is the area of the outer ring, rounded to the nearest hundredth of a square millimeter?



10. Construct a circle with these measurements:

a) a radius of 6cm

b) a diameter of 9cm

a) a circumference of 25cm



11. What patterns do you notice when you compare the circumference and diameter of different circles. Explain and justify your thinking using pictures, symbols and words.

12. How can you estimate the circumference of a circle without using the formula? What strategies might work?

13. If you double the diameter of a circle, what happens to the circumference? How can you show this in more than one way?

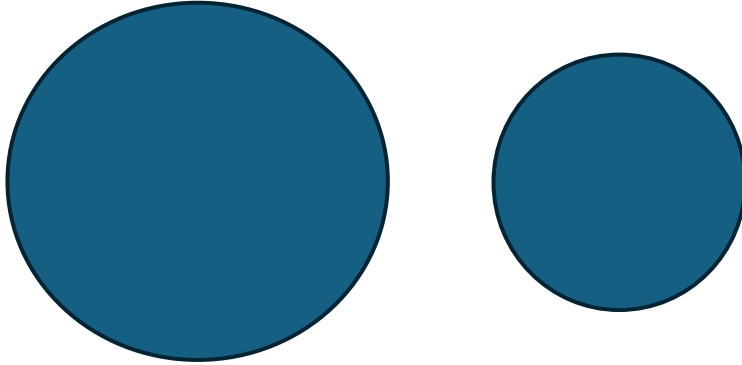
14. If two circles have the same circumference, do they have the same area? Why? Show your thinking using math.



15. Describe a situation in which you might want to estimate either the circumference or the area of a circle but would not want to calculate it exactly.

16. A circle has a radius of 10cm. Is it possible to create a rectangle with the same perimeter and a ratio of width to perimeter of about 1 to 10? If so, what are those measurements? Show your thinking.

17. You want to compare the circumferences of these two circles. What unit and what tool would you use? Why?





TASK: Design a geometric pattern using overlapping circles of different diameters.

Materials Needed

- Compass
- Pencil
- Eraser
- Blank or graph paper
- String for measuring distance around the circle

Include the Following

- At least six circles
- Include the following circle sizes
 - 8cm (large), 6cm (medium), 4cm (small)
- Circles must overlap with at least one other circle

Steps

- Draw the largest circle near the centre of your paper.
- Add the medium-sized circles so they overlap with the large circle.
- Fill gaps with smaller circles, making sure they overlap with others.
- Add other shapes to your design, if you like.
- Use colour or shading to enhance your design.



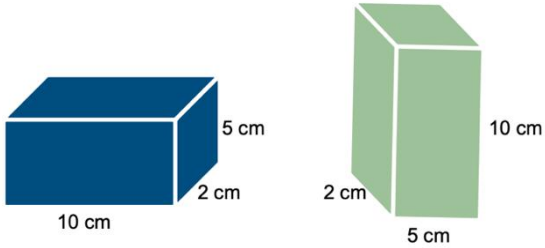
1. a. Construct a rectangular prism using cubes. Count and record the number of cubes that make up its volume, as well as the number of cubes in its base and its height. Enter your findings in the table.

Height of Prism	Area of Base	Volume of Rectangular Prism

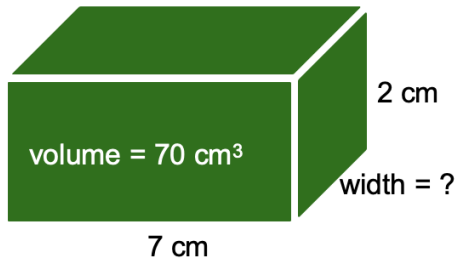
b) What is the relationship between the area of the base, the height of the prism, and the volume of a rectangular prism?

2. If the volume of a rectangular prism is 128 cubes and the height is 4 cubes, what is the area of the base?

3. Which box has a greater volume? Explain your reasoning.

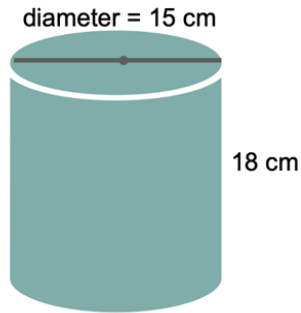
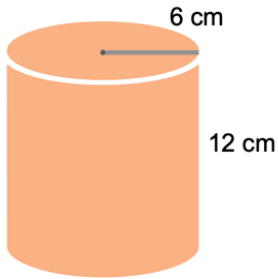


4.

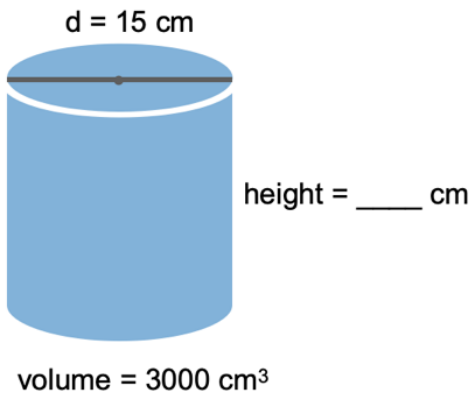




5. What is the volume of each cylinder?



6.



7. Aisha and Ben each have two cans with the same base radius of 4 cm. Aisha's can is shorter, with a height of 6 cm. Ben's can is taller, with a height of 9 cm. Ben says his can holds more liquid than Aisha's can. Is he correct? Explain your reasoning.

8. Lina is pouring juice into a tall glass. The area of the base of the glass is 12 cm^2 , and the glass is 15 cm high. When Lina finishes pouring, the juice reaches a height of only 13 cm. What is the volume of juice in the glass?



9. If a cylinder has a base with an area of 28cm^2 and a volume of 196cm^3 , what is its height?

10. Determine the volume of a cylinder that has a circumference of 46cm and a height of 20cm .



11. In what ways is calculating the volume of a cylinder similar to calculating the volume of a rectangular prism? Use pictures, numbers and words to share your thinking.

12. How does changing the height of a rectangular prism affect its volume if the base stays the same?



13. What patterns do you notice when you double one dimension of a prism? How does that compare to doubling two dimensions?

14. How many ways can you build a rectangular prism using 16 cubes. Show your thinking using pictures and numbers.



15. Two cylinders have the same height but different volumes. What makes them the same and what makes them different?



1. Solve

$$4x - 9 = 19$$

2. Solve

$$-6 + 3.5 - 2$$

3. Find 35% of 240.



4. A price increases from \$80 to \$92

What is the percent increase?

5. The ratio of boys to girls is 3 : 5.

If there are 40 students total, how many are boys?.



6. A car travels 360 km in 4 hours.

What is the unit rate in km per hour?

7. A rectangular prism has dimensions 6 cm, 4 cm, and 5 cm.

What is its volume?



8. The diameter of a circle is 14 cm.
What is the radius?

9. A bag contains 8 red and 12 blue marbles.
What is the probability of selecting a blue marble as a decimal?



10. A \$150 jacket is discounted by 20%.
What is the sale price?

11. Explain why increasing a number by 25% and then decreasing it by 25% does not return the original number.

12. A spinner has 8 equal sections. 3 are blue.

What is the experimental probability of landing on blue as a fraction and a percent?

13. A \$150 jacket increases in price by 12%.

What is the new price?



14. Explain why multiplying both terms of a ratio by the same number creates an equivalent ratio.

15. A student solves $3x + 6 = 21$ by subtracting 6 and dividing by 3. Explain why this method works.

16. A circle graph shows 30% of students prefer soccer.
If 200 students were surveyed, explain how you would determine how many prefer soccer.
17. Describe two different ways to determine the unit rate of 90 km in 1.5 hours.

18. Explain why subtracting a negative number results in a larger value.

19. Without calculating fully, determine which is greater:
40% of 150 or 60% of 90.
Explain your reasoning.

20. A \$200 fundraiser collects 15% more than expected.
The total money is then divided in a 2 : 3 ratio between two clubs.
Explain how you would determine how much each club receives.

21. A school fundraiser raised \$1200.

- 35% of the money is used to buy sports equipment.
- The remaining money is divided in the ratio 2 : 3 between two clubs.

How much money does each club receive?

Explain your reasoning and show all steps clearly.

1. Simplify the following ratios.

12 : 18	24 : 36
15 : 45	21 : 28
32 : 48	27 : 63

2. Find the missing values.

a) $5 : 8 = 15 : \underline{\quad}$

b) $\underline{\quad} : 9 = 4 : 6$

3. A car travels 240 km in 4 hours.

What is the unit rate in kilometres per hour?

4. The ratio of red beads to blue beads is 3 : 7.

If there are 40 beads in total, how many are red?

5. A recipe uses flour and sugar in the ratio 4 : 5.
If 20 cups of flour are used, how many cups of sugar are needed?

6. The ratio of grade 6's to grade 7's in a class is 2 : 3.
There are 30 students in total.
How many are grade 6's? How many are grade 7's?

7. Explain why the ratios $6 : 9$ and $2 : 3$ are equivalent.
Use more than one method to justify your answer.

8. A student says:
“If you double both numbers in a ratio, the ratio changes.”
Do you agree? Explain.

9. Without calculating exact values, determine which is greater:

$4 : 5$ or $7 : 9$.

Explain your reasoning.

10. Create a real life situation that could be represented by the ratio $3 : 8$.

Explain what each part represents.

11. The ratio of cats to dogs is 5 : 7.
If 3 more cats are added, does the ratio remain proportional?
Explain why or why not.

12. Explain how a ratio can be written as a fraction.
Use an example to support your explanation.

13. Two recipes use flour and sugar in ratios $2 : 3$ and $4 : 5$.
Are these proportional recipes? Explain how you know.

14. Store A sells 6 granola bars for 9 dollars.
Store B sells 10 granola bars for 14 dollars.
Without calculating both totals in detail, explain how you would determine which store offers the better deal.
Justify your reasoning.

15. A runner completes 15 km in 2 hours.

Two students found the unit rate in different ways.

One divided $15 \div 2$.

The other doubled both numbers to get 30 km in 4 hours and then divided.

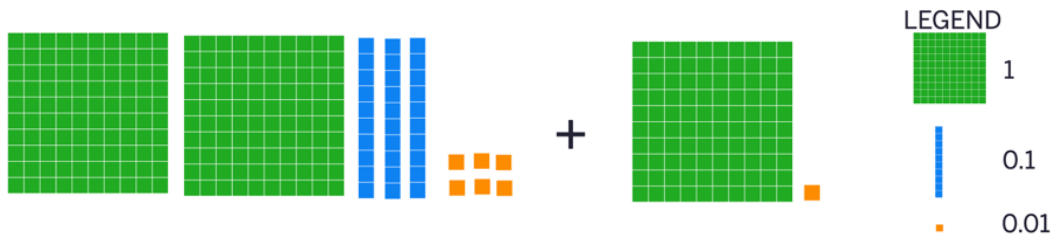
Are both strategies valid?

Explain why or why not.

16. The ratio of red marbles to blue marbles is 4 : 9.

Explain how you could determine the total number of marbles if you were told there are more than 100 marbles but fewer than 150.

1. Write an addition statement that represents the following model with base-ten blocks. Determine the sum of these decimal values.



2. Use front-end estimation to determine the sum of 62.57 and 28.41.

3. Find the value of $0.383 + 0.699$ using base-ten blocks. Represent your thinking using pictures and numbers.

4. Express the subtraction statement, $0.04 - 0.003$, in words.

5. Place the decimal point in the correct position in the answer to make a true statement. Explain your strategy.

a) $\$55.73 + \$18.75 + \$72.39 = \14687

b) $4189.675 - 1501.941 = 2687734$

6. Find the value of each expression. Show your reasoning.

$3250.52 - 465.6 =$	$22.563 + 45.22 + 4.088 =$	$2550.06 - 465.14 =$
---------------------	----------------------------	----------------------

7. Replace the \square with a number to make each of the following statements true.

a) 12.03

$$\begin{array}{r} + \square \\ \hline 15.13 \end{array}$$

b) 870.49

$$\begin{array}{r} - \square \\ \hline 630.20 \end{array}$$

8. Estimate, then calculate. Describe the strategy you used.

a) 78.2×5

b) 259.8×6

9. Use base-ten blocks to find the product of 55.4×3 .

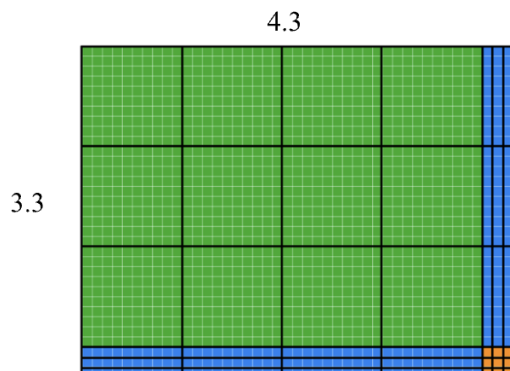
10. Find each product below using the equation $32 \times 48 = 1536$ and what you know about place value.

a) $3.2 \times 4.8 =$

b) $32 \times (0.048) =$

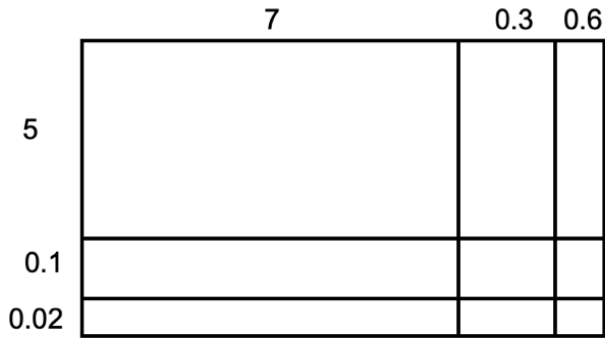
c) $0.032 \times (3.2) =$

11. Use the area model to determine the product of 4.3×3.3 , then represent your thinking using numbers.

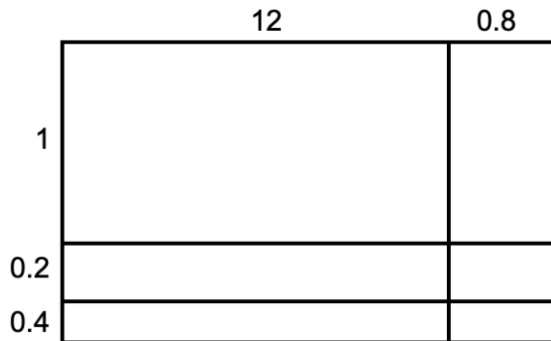


12. Use the area models (rectangle models) to find the products.

a)



b)



13. Calculate each without using a calculator. Show your thinking.

a) 2.87×73.48

b) 0.45×151.6

14. Estimate the quotient of $150.70 \div 2.6$.

15. Use an area model to find the quotient of $150.70 \div 2.6$.

16. Which of the following quotients has the same value as $5.04 \div 7$? Explain how you know.

- a) $5.04 \div 70$
- b) $50.4 \div 70$
- c) $504,000 \div 700$
- d) $504,000 \div 700,000$

17. Use base-ten blocks to model the calculation of $8 \div 1.5$.

18. Find the missing value of $36.8 \div 2.3$ using the area model. Show your thinking.

19. Calculate each without using a calculator. Show your thinking.

$24.2 \div 1.1$	$13.25 \div 0.4$	$170.28 \div 0.08$
-----------------	------------------	--------------------

20. What is the value of each expression?

$(4.5 + 2.3) \times 1.8 =$	$12.5 - (3.2 + 2.8) =$
$8.4 \div 2 + 1.6 =$	$(12.5 + 3.75) \div (4.5 - 2.25) + 6.4 =$

21. Which expression doesn't belong? Explain and justify your thinking using math.

- a) 2×0.3
- b) $2 \times 3 \times 0.1$
- c) 6×0.1
- d) 0.1×6

22. I am thinking of two numbers. Neither number is a whole number. Their product is 12.78. What might the numbers be?

23. Two numbers multiply to give a product between 18 and 19. What might these numbers be?



24. I multiplied 27 by a decimal and got an answer less than 27. What might be the decimal that I multiplied 27 by? Give at least 5 possibilities.

25. The area of a rectangle is 3.9 units squared. What might the perimeter be?



26. Explain why $51.2 \div 6.4$ has the same value as $5.12 \div 0.64$.

27. Write two division statements that have the same value as $61.12 \div 3.2$.

1. There is 0.162 liter of water in a 1-liter bottle. How much more water should be put in the bottle so it contains exactly 1 liter? Show your reasoning.

2. Diego is 59.5 inches tall. His brother is 40.125 inches tall. How much taller than his brother is Diego? Show your reasoning.

3. A person rolls a ten-sided die multiple times. After each roll, they write the number in one of the available boxes. The goal is to create a question where the sum is as close to 10 as possible. Once a number has been written, it cannot be erased or rewritten.

$$\square . \square + \square . \square = 10$$

-
4. Jodi went to a concession stand that sells pretzels for \$4.25, drinks for \$2.85, and bags of popcorn for \$1.99 each. He bought at least one of each item and spent no more than \$15.
- Could Jodi have purchased 2 pretzels, 2 drinks, and 2 bags of popcorn? Explain your reasoning.
 - Could he have bought 1 pretzel, 1 drink, and 5 bags of popcorn? Explain your reasoning.

5. A bag of nickels weighs 5.1 kilogram. Each nickel weighs 2.5 grams. About how many nickels are in the bag?

6. A roll of ribbon was 12 meters long. Diego cut 9 pieces of ribbon that were 0.4 meter each to tie some presents. He then used the remaining ribbon to make some wreaths. Each wreath required 0.6 meter. For each question, explain your reasoning.

- a) How many meters of ribbon were available for making wreaths?
- b) How many wreaths could Diego make with the available ribbon?



7. A swimming pool is being filled with water at a rate of 2.4 liters per minute. After 35 minutes, the pool already has 18.5 liters in it?

8. A car travels 248.6 km on the first day and 312.4km on the second day. On the third day it travels half the distanced of the second day. What is the total distance travelled?

TASK: Planning a Movie Night

You are organizing a movie night for 8 friends with a budget of \$75. You need to provide snacks and drinks for everyone. Your plan should include:

- 2 types of snacks (e.g., popcorn, chips, candy)
- 2 types of drinks (e.g., soda, juice, ice tea, water)

Serving Size Guidelines

- Popcorn: 50g per person (1 large bag is about 200g)
- Chips: 28g per person (1 standard bag is about 200g)
- Candy: 57g per person (1 pack is about 113g)
- Drinks: 2 drinks per person (1 can/bottle is about 355mL)

Planning Rules

Choose the exact items to buy from a grocery store and decide on the quantities to buy of each items so that you stay on budget. Use the graphic organizer to record your choices, costs and total cost per person.

Item	Quantity	Subtotal (\$)
TOTAL COST		

- Calculate the cost per person for the party.
- Did you stay under budget? If not, revise your shopping list to ensure you stay under budget. Explain the refinements you made.

1. Convert the following decimals to percents.

0.6	0.125
1.35	0.048

2. Convert the following percents into decimals.

48%	7.5%
120%	0.4%

3. Find 25% of 84.

4. Find 18% of 250.

5. What is 150% of 60?

6. What is 0.5 percent of 400?

7. 12 is 20% of what number?

8. 45 is 75% of what number?

9. A jacket costs 120 dollars. It is discounted by 15%.
What is the sale price?

10. A price increases from 80 dollars to 92 dollars.
What is the percent increase?

11. A population decreases from 500 to 425.
What is the percent decrease?

12. Which is greater:
35% of 200 or 60% of 120?



13. Explain why 25%, 0.25, and $\frac{1}{4}$ represent the same quantity.
Use a model or example to support your explanation.

14. Without calculating exactly, determine which is greater:
40% of 90 or 30% of 120.
Explain your reasoning.



15. A student says:

“Increasing a number by 20% and then decreasing it by 20% returns the number to its original value.”

Do you agree? Explain why or why not.

16. Explain why 150% of a number is greater than the original number.
Use an example to support your explanation.



17. Create a real-life situation where 5% would represent a very large amount. Explain your reasoning.

18. A store advertises 30% off. Explain two different ways you could determine the sale price of an item.

19. Without converting to decimals, determine whether $\frac{3}{8}$ is greater or less than 40%.

Explain how you know.

20. Describe what 0.5% represents.

Use a visual or numerical example to support your explanation.

1. Write the integers modelled by the counters below, if red counters are negative and yellow counters are positive.

- a)  

2. Mark these integers on the number line below:

- a) +2
b) -8
c) +9
d) -1



3. Use an integer to represent each situation.

- a) 15 m below sea level
- b) Lola deposited \$35 in her bank account
- c) Miku the dog dug a hole 2 m deep
- d) A parking spot 3 levels above ground level
- e) A drop in price of \$1
- f) 7 steps backward

4. Order the integers in the following sets from least to greatest.

a) $-7, -11, +11, 0, -3$

a) $+46, -38, -40, -11, +25$

5. Name the opposite of each integer.

a) -20

b) 125

c) -7

6. What integer comes next in each of the following number patterns:

a) $3, 2, 1, 0, -1, -2,$

b) $-6, -4, -2,$

c) $10, 7, 4, 1,$

7. Fill in the less than ($<$) or the greater than ($>$) symbol to show the relationship between each pair of numbers.

a) 2 ____ 6

b) -4 ____ 5

c) 3 ____ -7

d) -1 ____ 2

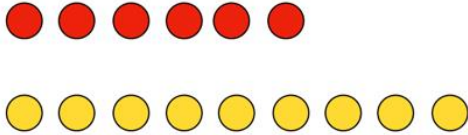
8. What is the sum of -2 and $+2$? Explain your thinking using either a number line or double-sided counters. Use your response to predict the sum of any opposite integers. Explain your thinking.




9. Use double sided counters to find the sum of $(+4)$ and (-2) . Use the graphic organizer below to show your thinking.

<p>Draw a picture of the counters that represent $+4$ and -2.</p>	<p>Combine the counters by organizing them into as many zero pairs as possible.</p>
<p>Draw the counters that are left over. Write the integer that represents these counters.</p>	<p>Complete the addition statement $(+4) + (-2) = \underline{\quad}$</p>

10. What addition statement does the diagram represent?



11. Use a number line to find the sum of $(+9)$ and (-5) . Use the graphic organizer below to show your thinking.

<p>Represent your thinking on the number line.</p> 	<p>Complete the addition statement $(+9) + (-5) = \underline{\quad}$</p>
--	---

12. Find the sum.

- a) $(-3) + (4) =$
- b) $(+11) + (-7) =$
- c) $(-5) + (-6) =$
- d) $(-2) + (+1) + (-9) =$

13. A magic square is a grid where the sum of each row, column and diagonal is the same. Fill in the missing numbers in the magic square below. Show your thinking and check your work.

4		-3
	0	
-2		5

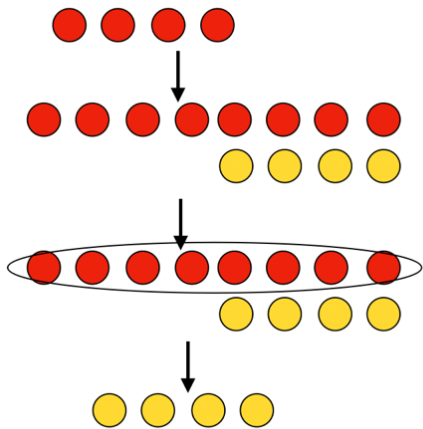
14. Is the puzzle below a magic square? Explain and justify your thinking.

-8	-1	6
3	4	7
-2	9	5

15. Use double sided counters to find the difference, $(+3) - (-6)$. Use the graphic organizer below to show your thinking.

<p>Draw a picture of the counters that represent $(+3)$.</p>	<p>Draw the zero pairs needed to be able to remove (-6).</p>
<p>Remove (-6), and draw the counters that are left over.</p>	<p>Complete the subtraction statement $(+3) - (-6) = \underline{\quad}$</p>

16. Write the subtraction statement that the diagram represents.



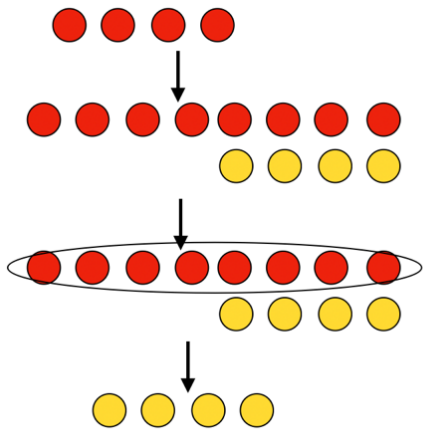
17. Determine the difference using double-sided counters. Show your thinking using picture and numbers.

a) $(-5) - (-3) =$

b) $(+7) - (-5) =$

c) $(+2) - (+9) =$

16. Write the subtraction statement that the diagram represents.



17. Determine the difference using double-sided counters. Show your thinking using picture and numbers.

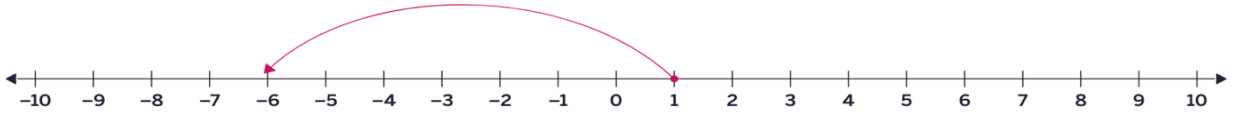
a) $(-5) - (-3) =$

b) $(+7) - (-5) =$

c) $(+2) - (+9) =$

18. Write the subtraction statement that the diagram represents.

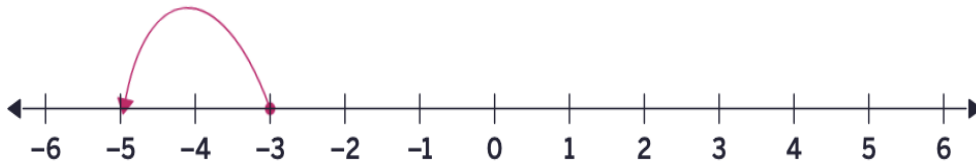
a)



b)



c)



19. Find the difference using an open number line. Show your thinking.

a) $(-23) - (+17) =$



b) $(+122) - (-46) =$

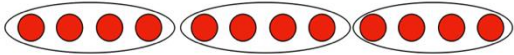


c) $(-415) - (-55) =$

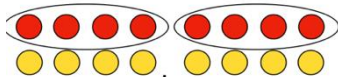
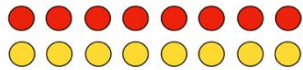


20. Determine the multiplication statement that the diagram represents.

a)



b)



21. Determine the product using double-sided counters. Use pictures to show your thinking.

a) $(+6) \times (-7) =$

b) $(-6) \times (-1) =$

c) $(+5) \times (-3) =$

22. Write the expression as a multiplication statement.

$$(-2) + (-2) + (-2) + (-2)$$

23. Determine the multiplication statement that the diagram represents.



24. Copy and complete the multiplication statement.

$$(-4) \times \square = + 12$$

25. Determine $(-15) \div (-3)$ using a number line.



26. Determine each quotient.

a) $(-75) \div (+25) =$

b) $(-48) \div (-8) =$

c) $(-324) \div (12) =$

d) $456 \div (-24) =$

e) $(-672) \div (-28) =$



27. Which expression equals $(-4) \times (+6)$?

- a) $(-12) \times (-2)$
- b) $(-24) \div (-1)$
- c) $(+3) \times (+8)$
- d) $(+72) \div (-3)$

28, Calculate using order of operations.

a) $8 + 3 \times 4 - 6$

b) $(-12 - 5) \times (-3) + (-8)$

c) $20 \div (-4 + 1) + 7$

d) $(-18 \div 3) + (7 \times -2)$

e) $[-6 + (4 \times -3)] \div 2$

29. Complete the statement by including operation symbols to make the statement true.

$$5 \square (-9) \square \square 4 (-1) = 41$$

30. Sofia evaluated the expression $(-3) \times (6-2) + 4$ to equal -14 . What mistake did she make? What is the correct value of the expression?



31. You add two numbers and the answer is negative.
What two numbers might you have added?

32. Would you calculate $(-16) - (-4)$ in the same way you would calculate $16 - (-5)$?
Explain your thinking.

33. Predict the sum of any pair of opposite integers. Explain your reasoning using pictures, words, numbers and symbols.

34. Would you rather solve expression, a or b? Explain your reasoning before calculating.

a) $(-12 - 4) \times (-3) + 8$

b) $12 - (4 \times (-3) + 8)$

35. How are the following expressions the same? How are they different? Which operation changes the outcome the most?

a) $(-5 + 8) \times 4$

b) $-5 + (8 \times 4)$

36. Which one doesn't belong? Share all possible reasons.

- a) $(6+3) \times (-2)$
- b) $6 + (3 \times (-2))$
- c) $(-6 + 3) \times 2$
- d) $6 - (3 \times 2)$

37. Convince Me! Convince me that $(10 - 4) \times (-3) + 2$ will give you a negative answer, without calculating every step. What clues can you use? How does the order of operations help you predict the sign?

38. When you multiply two negative integers and then add a positive integer, the result is always negative. Is this always, sometimes, or never true? Give examples to justify your answer.

1. A soccer tournament had 8 teams. Each team played 3 matches. Each win gives 3 points, a draw gives 1 point, and a loss gives 0 points. If one team won 2 matches and drew 1 match, how many points did they earn?

2. A bookstore sold 15 books on Monday and 12 books on Tuesday. Each book costs \$8. The store gave a discount of \$20 on the total bill. What was the total amount collected after the discount?



3. A school rented 4 buses for a field trip. Each bus can carry 36 students. There are 128 students going. After filling the buses, how many students will not have a seat?

4. A fruit seller has 120 apples. He packs them into boxes of 8 apples each. Each box sells for \$5. If he sells all the boxes, how much money does he make?

5. A charity organization collected \$450 at an event. They spent \$125 on food and \$75 on decorations. The remaining amount was divided equally among 5 families. How much did each family receive?

6. How much colder is -5°C than $+3^{\circ}\text{C}$?



7. A new freezer is at a room temperature of 20°C . When the freezer is turned on, the temperature inside drops by 6°C per hour. How long does it take the freezer to reach -12°C .

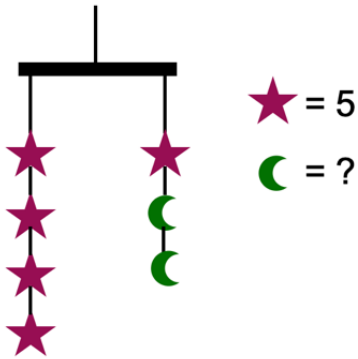
8. Because the charging cable is faulty, Maya's phone battery is charging 15% slower than normal every hour. At 6:00pm, she starts charging her phone, and it shows 50% battery. Normally, her phone would reach 100% in 4 hours. What will her phone's battery percentage be at 10:00pm?



9. Why does it make sense that $(-3) - (-9)$ has to have the same result as $(-2) - (-8)$ or $0 - (-6)$?

10. You add the product of two integers to the product of a different two integers and end up with 1. What could you have multiplied and added?

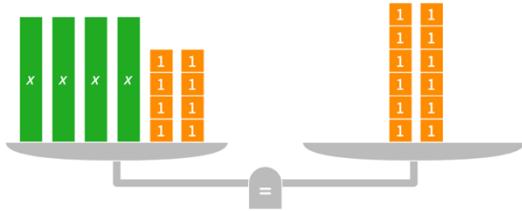
1. Use an algebraic equation to determine the value of the crescent moon. Show your thinking.



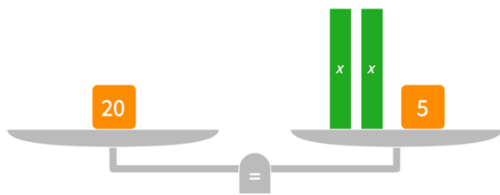
2. Draw a picture to model the equation $-3x + 7 = 19$, using algebra tiles.

3. Solve the equation modelled by each balance scale. Show your thinking using pictures and numbers.

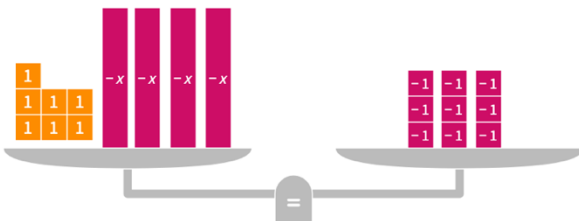
a)



b)



c)



4. Use algebra tiles to solve the equations. Check each solution using symbols.

a)



Diagram showing algebra tiles for equation a): Two green rectangular tiles labeled x and four pink square tiles labeled -1 are arranged on the left. An equals sign follows. On the right, there are ten orange square tiles labeled 1 , arranged in two rows of five.

b)

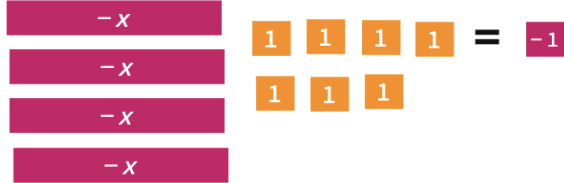


Diagram showing algebra tiles for equation b): Four purple rectangular tiles labeled $-x$ are arranged vertically on the left. To the right are seven orange square tiles labeled 1 (arranged in two rows of four and three) and one pink square tile labeled -1 on the far right, following an equals sign.

c)



Diagram showing algebra tiles for equation c): Six pink square tiles labeled -1 are arranged in two rows of three on the left. An equals sign follows. On the right, there are two green rectangular tiles labeled x and ten orange square tiles labeled 1 (arranged in two rows of five).



5. Show whether $x = -5$ is the solution to each equation.

$$-6x + 4 = 34$$

$$3 - 8x = 43$$

$$27 = -9x - 18$$

$$40 = 5x + 65$$



6. What is the first operation you should perform to solve each equation. Share your thinking.

a) $2x - 2 = 16$

b) $9 - 9y = -27$

c) $71 = -9x - 1$

7. Use inverse operations to solve the equations. Show your steps and check your solutions.

a) $6x - 4 = -32$

b) $22 = -5x - 3$

c) $-30 = 7x - 9$

8. Use inverse operations to solve the equations. Show your steps and check your solutions.

$$\frac{x}{5} - 7 = 1$$

$$\frac{y}{-3} + 4 = -6$$

9. Create word sentences.

Word Sentence	Equation
Three times a number plus two is ten.	$3x + 2 = 10$
	$3x = 9$
	$2x + 4 = 10$
	$9 = 5x - 27$
	$7 + 4x = 12$



10.

ADD EM UP: TWO STEP EQUATIONS

$-16 - 5x = -16$	$7x + 2 = 23$
SUM:	
$48 = 45 - \frac{x}{6}$	$6x - 11 = -23$

11. You write the equation $4x - 5 = 15$ to solve a word problem. What might the word problem be?

12.

TWO-STEP EQUATIONS: POSITIVE AND NEGATIVE VALUES

Directions: Using the digits 1 to 9 at most one time each, place a digit in each box to create two equations: one where x has a positive value and one where x has a negative value. You may reuse all the digits for each equation.

$$\boxed{}x + \boxed{} = \boxed{}$$



1. How many laps did the players run if the coach told them to run nine less than six times the number of laps they ran yesterday, and that total was 15?

2. Lilly has two more than three times as many candies as Max. If she has 17 candies, how many does Max have?



3. How many pencils are there if, five times the number of pencils plus nine equals thirty-four.

4. If Marcus triples the amount of money he has now, and then spends \$75, he will have just enough left to buy a new laptop that costs \$450. Write and solve an equation to determine how much money Marcus has now.



5. If a number is doubled and five is subtracted from the product, the result is nine.
What is the number?