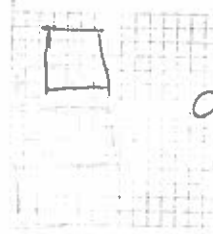


Unit 1: Square Roots and Pythagorean Theorem

1. Use the grids below to show that 16 is a square number but 10 is not. Explain how you know!!

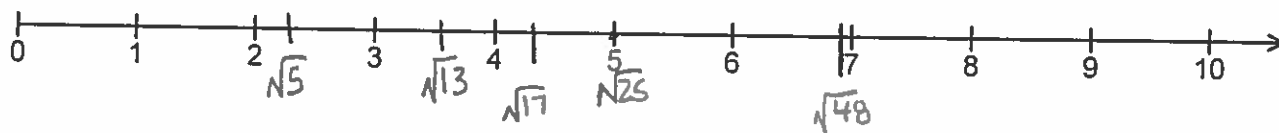
$16 = 4 \times 4$
 Since it has 2 equal factors, it is a sq. #.
 16: 1, 2, 4, 8, 16
 10: 1, 2, 5, 10
 Not a perfect sq. #!

 a 4x4 square has an area of 16.

2. Calculate each of the following:

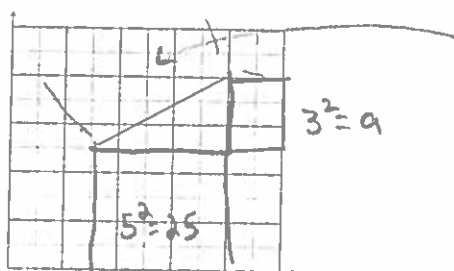
- a) the square of 8 $8^2 = 64$ b) $\sqrt{64} = 8$ c) the square root of 9 $\sqrt{9} = 3$ d) $6^2 = 36$

3. Order from least to greatest: $\sqrt{81}, 10, 2^2, \sqrt{25}$
 $\frac{9}{9} \quad \frac{10}{10} \quad \frac{4}{4} \quad \frac{5}{5}$ $2^2, \sqrt{25}, \sqrt{81}, 10$

4. Place each of the following on the number line below: $\sqrt{17}, \sqrt{5}, \sqrt{48}, \sqrt{25}, \sqrt{13}$

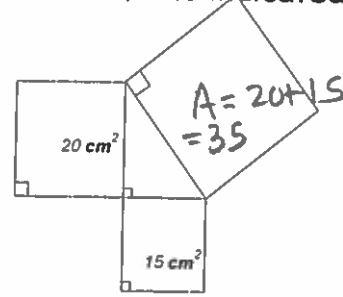


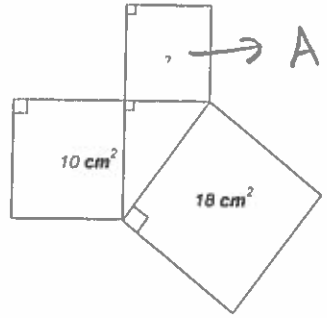
5. Find the length of the line segment below:



$A = 9 + 25 = 34$
 length = $\sqrt{34} \approx 5.8$

6. Find the area of the indicated square.

a) 
 $A = 20 + 15 = 35$

b) 
 $A = 18 - 10 = 8$

7. Are the numbers 6, 7, 8 a Pythagorean Triple? Explain how you know.

$6^2 = 36$ $7^2 = 49$ $8^2 = 64$
 $36 + 49 = 85$
 Since $85 \neq 64$, $6^2 + 7^2 \neq 8^2$ and is not a Pythagorean Triple.

8. Find the length of the missing side. Estimate your answers to one decimal place. Show how you estimated your answer!

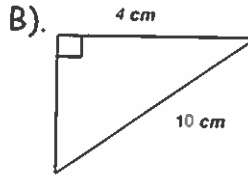
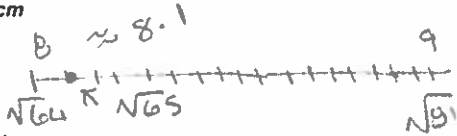
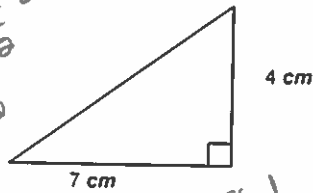
A). $a^2 + b^2 = c^2$

$4^2 + 7^2 = c^2$

$16 + 49 = c^2$

$65 = c^2$

$c = \sqrt{65} \approx 8.1$



$a^2 + b^2 = c^2$

$a^2 + 4^2 = 10^2$

$a^2 + 16 = 100$

$a^2 = 84$

$a = \sqrt{84} \approx 9.2$

9. To go around a garden, Mark travels 10 meters north and 5 meters east. If he had cut through the garden, how far would he have travelled?

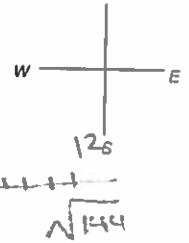
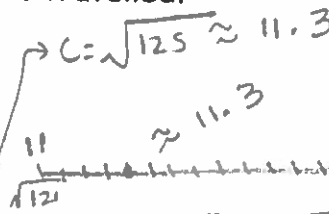


$a^2 + b^2 = c^2$

$5^2 + 10^2 = c^2$

$25 + 100 = c^2$

$c^2 = 125$



Unit 2: Integers

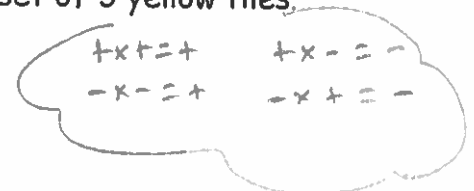
1. Which multiplication is the best representation of $(-5) \times (+3)$ if yellow tiles represent positive and red tiles represent negative?

A. Deposit 5 sets of 3 red tile

B. Deposit 5 set of 3 yellow tiles.

C. Withdraw 5 sets of 3 red tiles.

D. Withdraw 5 set of 3 yellow tiles.



2. Which calculation would have an answer of +12?

A. $(-24) \div (+2) = -12$

B. $(-3) \times (+4) = -12$

C. $(-2) \times (-6) = +12$

D. $(+36) \div (-3) = -12$

3. What is $(-20) \div (-4)$?

A. -80

B. -5

C. +5

D. +80

+ Time always positive!

4. The water in my swimming pool dropped 4 cm each hour for 6 hours. Which representation is best for this situation?

A. $(-6) \div (+4)$

B. $(-6) \times (+4)$

C. $(+6) \div (-4)$

D. $(+6) \times (-4)$

5. What is the missing integer in $(-40) \div \square = (-5)$?

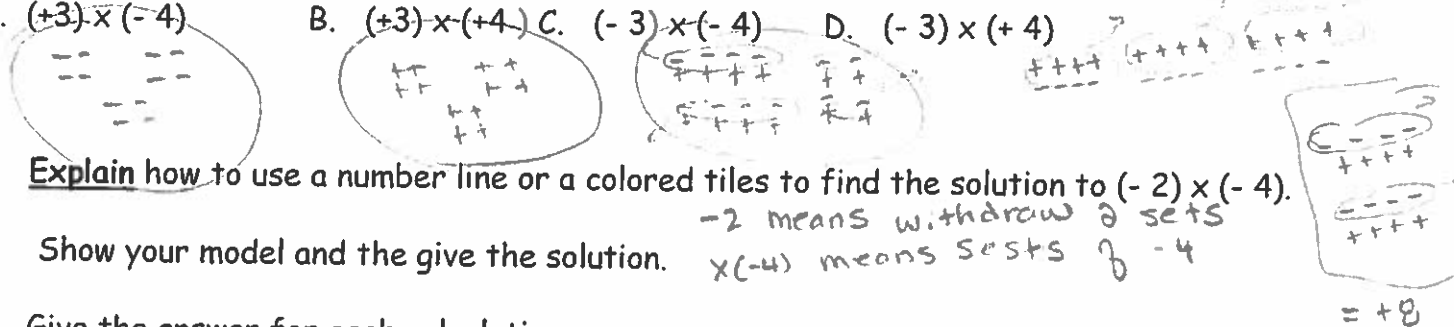
- A. -200 B. -8 **C. +8** D. +200

6. What calculation should be done first in $(+3) \times (-4) + [(-20) \div (+5) + (+2)]$?

- A. $(+3) \times (-4)$ B. $(-4) + (-20)$ **C. $(-20) \div (+5)$** D. $(+5) + (+2)$

7. What multiplication sentence is represented in the diagram if shaded is negative?

- A. $(+3) \times (-4)$ B. $(+3) \times (+4)$ C. $(-3) \times (-4)$ D. $(-3) \times (+4)$



8. Explain how to use a number line or a colored tiles to find the solution to $(-2) \times (-4)$.

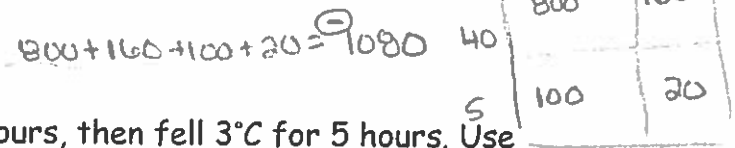
Show your model and then give the solution.

*-2 means withdraw 2 sets
x(-4) means sets of -4*

9. Give the answer for each calculation.

- A. $(+8) \times (-3) = -24$ B. $(-5)(+7) = -35$ C. $(-50) \div (+10) = -5$ D. $(-36) \div (-9) = +4$

10. Use a rectangle model to find $(-24) \times (+45)$.



11. The temperature rose 2°C each hour for 4 hours, then fell 3°C for 5 hours. Use integers to find the total change in temperature.

$$(+2)(+4) + (-3)(+5) = +12 + (-15) = -3 \text{ dropped } 30$$

12. In a darts game, John threw 8 darts and scored five (-3) scores, two $(+2)$ scores and one $(+3)$ scores. What was the mean score?

$$\begin{aligned} & 5(-3) + 2(+2) + (+3) \\ &= (-15) + (+4) + (+3) \\ &= (-11) + (+3) = \underline{\underline{-8}} \end{aligned}$$

13. Evaluate.

A. $6 - (-42) \div 3 + 5(-6)$
 $= 6 - (-14) + (-30)$
 $= 20 + (-30)$
 $= -10$

B. $\frac{(-6) + (-2) \times 8}{[10 + (-4)] + [(-12) \div 3]}$ $= \frac{-6 + -16}{2 + -4}$
 $= \frac{-22}{-2}$
 $= \underline{\underline{+11}}$

Unit 3: Operations with Fractions

- 1) What multiplication statement is represented by the number line shown?



$$4 \times \frac{3}{5} = 1 \frac{3}{5}$$

- 2) What multiplication statement is represented by the set of fraction circles?



$$3 \times \frac{5}{6} = 2 \frac{1}{2}$$

- 3) What multiplication statement is represented by the area model shown to the right?

- 3) Write $4 \times \frac{2}{5}$ as repeated addition. $\frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5}$

- 4) Write $5 \frac{1}{2}$ as an improper fraction. $\frac{11}{2}$

- 5) Find $\frac{4}{5}$ of 20. $\Rightarrow \frac{4}{5} \times \frac{20}{1} = \frac{80}{5} = 16$

- 6) Find the reciprocal of $\frac{2}{11}$. $\frac{11}{2} = 5 \frac{1}{2}$

- 8) Which operation must be completed first? $\frac{3}{4} + \frac{2}{5} - \frac{1}{3} \div \frac{1}{2}$

$$\frac{3}{4} + \frac{2}{5} - \frac{1}{3} \div \frac{1}{2}$$

$$\frac{12}{8}$$

- 9) Jane evaluated the following expression incorrectly. Step One: $\frac{2}{5} + \frac{4}{9} \times \left(\frac{3}{2} - \frac{3}{8}\right)$

$$\frac{2}{5} + \frac{4}{9} \times \left(1 \frac{1}{2} - \frac{3}{8}\right)$$

Step Two: $\frac{2}{5} + \frac{4}{9} \times \left(\frac{6}{8}\right) *$

Step Three: $\frac{2}{5} + \frac{1}{3}$

In which step did she make her mistake?

Step Four: $\frac{11}{15}$

- 10) Multiply or divide each of the following as indicated. Be sure to show your workings.

A) $6 \times \frac{5}{12} = \frac{5}{2} = 2 \frac{1}{2}$

B) $\frac{7}{9} \div \frac{2}{3} = \frac{7}{8} \times \frac{3}{2} = \frac{21}{16} = 1 \frac{5}{16}$

C) $\frac{5}{8} \times \frac{12}{15} = \frac{1}{2}$

D) $2 \frac{1}{4} \times 2 \frac{2}{3} = \frac{9}{4} \times \frac{8}{3} = 6$

E) $3 \frac{3}{4} \div 1 \frac{2}{3} = \frac{15}{4} \div \frac{5}{3} = \frac{15}{4} \times \frac{3}{5} = \frac{9}{4} = 2 \frac{1}{4}$

- 11) Evaluate the following, showing all steps.

A) $\frac{2}{3} + \frac{3}{5} \times 3 \frac{3}{4}$

B) $\left(\frac{2}{5} \times \frac{3}{4}\right) + \left(\frac{2}{3} \div \frac{5}{6}\right)$

C) $\frac{4}{9} \times \left(\frac{2}{3} - \frac{1}{6}\right) - \frac{1}{8} \times \frac{4}{3}$

- 12) Mr. King is putting fertilizer on his trees. He has $3 \frac{5}{8}$ bags of fertilizer and needs

$\frac{3}{4}$ of a bag for each tree. How many trees will he be able to fertilize?

$$3 \frac{5}{8} \div \frac{3}{4} = \frac{29}{8} \div \frac{3}{4} = \frac{29}{8} \times \frac{4}{3} = \frac{29}{6} = 4 \frac{5}{6}$$

\Rightarrow He can do 4 (almost 5) trees.

$$\begin{aligned}
 \text{11 A)} \quad & \frac{2}{3} + \frac{3}{5} \times 3\frac{3}{4} \\
 & = \frac{2}{3} + \frac{3}{5} \times \frac{18}{4} \\
 & = \frac{2}{3} + \frac{9}{4} \\
 & = \frac{8}{12} + \frac{27}{12} \\
 & = \frac{35}{12} = 2\frac{11}{12}
 \end{aligned}$$

$$\begin{aligned}
 \text{B)} \quad & \left(\frac{3}{5} \times \frac{3}{4}\right) + \left(\frac{2}{3} + \frac{5}{6}\right) \\
 & = \frac{3}{10} + \left(\frac{2}{3} + \frac{5}{6}\right) \\
 & = \frac{3}{10} + \frac{4}{5} \\
 & = \frac{3}{10} + \frac{8}{10} \\
 & = \frac{11}{10} = 1\frac{1}{10}
 \end{aligned}$$

$$\begin{aligned}
 \text{C)} \quad & \frac{4}{9} \times \left(\frac{2}{3} - \frac{1}{6}\right) - \frac{1}{8} \times \frac{4}{3} \\
 & = \frac{4}{9} \times \left(\frac{4}{6} - \frac{1}{6}\right) - \frac{1}{6} \\
 & = \frac{4}{9} \times \frac{1}{2} - \frac{1}{6} \\
 & = \frac{2}{9} - \frac{1}{6} \\
 & = \frac{4}{18} - \frac{3}{18} \\
 & = \frac{1}{18}
 \end{aligned}$$

13) Antoine estimates he can read one chapter of a novel in $1\frac{1}{4}$ h.

Jenna estimates she can read three chapters of the same novel in $2\frac{2}{3}$ h.

Antoine read for 8 h. Jenna read for 6 h. Who read more chapters? Show your work.

$$A: 8 \div 1\frac{1}{4} = 8 \div \frac{5}{4} = 8 \times \frac{4}{5} = \frac{32}{5} = 6\frac{2}{5} \text{ Chapters}$$

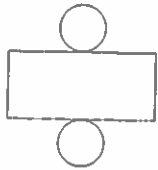
$$J: 2\frac{2}{3} \div 3 = \frac{8}{3} \times \frac{1}{3} = \frac{8}{9} \text{ chapter per hour}$$

$$\hookrightarrow 6 \times \frac{8}{9} = \frac{48}{9} = 5\frac{1}{3} \text{ chapters}$$

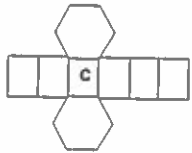
Unit 4: Measuring Prisms and Cylinders

1. Name the object that can be made from this net.

Antoine read more.



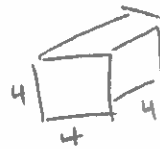
Cylinder



hexagonal prism

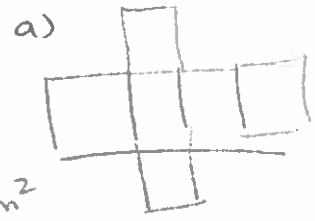
2. The length of one side of a cube is 4 cm.

- Sketch a net of the cube.
- Calculate the area of one side.
- Calculate the total surface area of the cube.



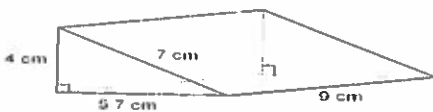
$$b) A = 4 \times 4 = 16 \text{ cm}^2$$

$$c) SA = 6 \times 16 = 96 \text{ cm}^2$$

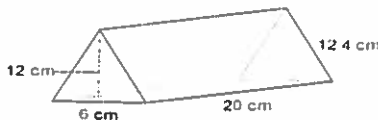


3. Find the surface area of these right triangular prisms.

(a)



(b)



$$3a) \Delta A = \frac{bh}{2} = \frac{4 \times 5.7}{2}$$

$$= 11.4 \text{ (x2)}$$

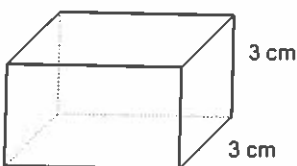
$$SA = 11.4 + 11.4 + 51.3 + 63 + 36$$

$$= 173.1 \text{ cm}^2$$

$$\square A = bh$$

- ① $5 \times 9 = 51.3$
- ② $7 \times 9 = 63$
- ③ $4 \times 9 = 36$

4. Find the volume of this square prism.



$$V = A \times h = 19 \times 3 \times 3 = 171 \text{ cm}^3$$

3b)

$$\Delta A = \frac{bh}{2} = \frac{6 \times 12}{2}$$

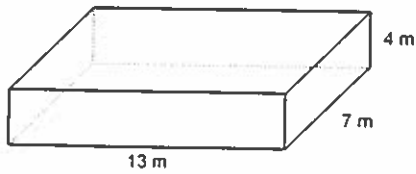
$$= 36 \text{ (x2)}$$

$$\square A = bh = 6 \times 20 = 120$$

$$12.4 \times 20 = 248 \text{ (x2)}$$

$$SA = 36 + 36 + 120 + 248 + 248 = 588 \text{ cm}^2$$

5. Calculate the surface area of this right rectangular prism.



T/B

$$A = bh$$

$$= 13 \times 7$$

$$= 91 (\times 2)$$

Sides

$$A = bh$$

$$= 7 \times 4$$

$$= 28 (\times 2)$$

T/B

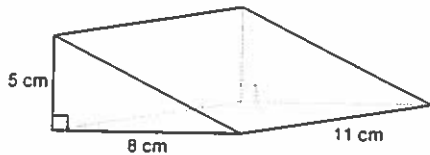
$$A = bh$$

$$= 13 \times 4$$

$$= 52 (\times 2)$$

$$SA = 91 + 91 + 28 + 28 + 52 + 52 = 342 \text{ m}^2$$

8. Calculate the volume of this triangular prism.



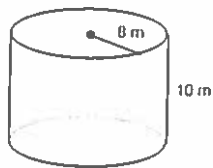
$$V = A \times h$$

$$= \frac{bh}{2} \times H$$

$$= \frac{8 \times 5}{2} \times 11$$

$$= 220 \text{ cm}^3$$

9. Calculate the surface area and volume of these cylinders.



$$SA = 2\pi r^2 + 2\pi rh$$

$$= 2(3.14)(8)(8) + 2(3.14)(8)(10)$$

$$= 904.3 \text{ m}^2$$

$$V = \pi r^2 h$$

$$= 3.14(8)(8)(10)$$

$$= 2009.6 \text{ m}^3$$

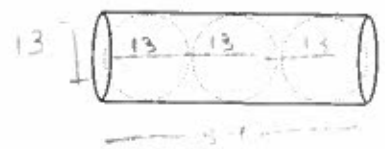
10. This diagram shows 3 balls packed in a cylindrical container. The diameter of each ball is 13 cm.

Calculate the volume of the container.

$$V = \pi r^2 h$$

$$= 3.14 \times 6.5 \times 6.5 \times 39$$

$$= 5173.9 \text{ cm}^3$$



Unit 5: Percent, Ratio and Rate

1. What is the equivalent decimal value for $\frac{3}{4}\%$? $0.75\% =$

- (a) 75 (b) 7.5 (c) 0.075 (d) 0.0075

2. What number is 20% of 60? (a) 12 b) 72 c) 300 d) 1200

$$0.20 \times 60$$

3. What is an equivalent ratio to 4:5? a) 5:4 b) 16:25 (c) 20:25 d) 24:25



4. Write 0.58 in percent form. (a) 58% (b) 5.80% (c) 0.58% (d) 580%

5. If 20% of an unknown number is 5, what is the number?

(a) 2.5 (b) 25 (c) 25.5 (d) 250



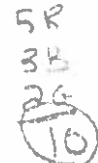
6. A \$120 video game is selling for 30% off the regular price. What is the sale price (excluding tax) of the video game?

(a) \$36 (b) \$84 (c) \$204 (d) \$150

$$\begin{aligned} &70\% \text{ of } 120 \\ &= 0.70 \times 120 \\ &= 84 \end{aligned}$$

7. A box contains 5 red marbles, 3 blue marbles, and 2 green marbles. What is the ratio of blue marbles to all the marbles in the box?

(a) 3:5 (b) 3:7 (c) 3:8 (d) 3:10



8. What is the unit rate if Bill can cycle 42 km in 3 hours?

(a) 14 km/h (b) 39 km/h (c) 45 km/h (d) 126 km/h

$$\frac{42 \text{ km}}{3 \text{ h}} = \frac{14 \text{ km}}{1 \text{ h}}$$

$$\frac{3.89}{7} = 0.55$$

9. Which is the better buy? (a) 5 yogurt for \$2.99 (b) 7 yogurt for \$3.89

(c) 10 yogurt for \$4.79 (d) 11 yogurt for \$5.29

$$\frac{4.79}{10} = 0.479$$

$$\frac{5.29}{11} = 0.48$$

10. What is 18:3 in simplest terms? 6:1

11. Find 150% of 300. $1.50 \times 300 = 450$

12. Write 250% as a fraction in simplest terms. $\frac{250}{100} = \frac{5}{2}$ or $2\frac{1}{2}$

13. Find the value of n. (A) $7:14 = 4:n$ $n=8$ (B) $3:4:6 = 9:n:18$ $n=12$

14. Complete the following. Show your work.

(a) Find 35% of 250.

$$0.35 \times 250 = 87.5$$

(b) 20% of a number is 4. What is the number?



$$4 \div 20\% = 20$$

$$= 4 \div 0.20 = 20$$

15. Sue scored 16 out of 20 on a quiz. Peter scores 23.5 out of 30. Who had the higher % score. What was the difference in the % score?

$$\frac{16}{20} = 16 \div 20 = 0.8 = 80\%$$

$$\frac{23.5}{30} = 23.5 \div 30 = 0.78\bar{3} = 78\%$$

$$\begin{array}{r} 80 \\ -78 \\ \hline 2\% \end{array}$$

difference.

16. A plasma T.V that sold for \$1050 at Christmas time now sells for \$750. What is the percentage decrease in the price of the T.V?

$$\% = \frac{C}{O} \times 100$$

$$1050 - 750 = 300$$

$$= \frac{300}{1050} \times 100 = 0.286 = 28.6\%$$

17. The scale on a map of NL is 1: 500 000. This means that 1 cm on the map represents 500 000 cm in actual distance. If the distance on the map between St. John's and Gander is 6.2 cm, what is the actual distance between St. John's and Gander?

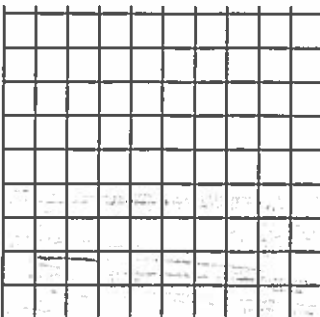
$$\frac{1}{500\ 000} = \frac{6.2}{x}$$

$$x = 3\ 100\ 000\ \text{cm} = 31\ \text{km}$$

18. A pair of in-line skates regularly sells for \$295. They are on sale for 1 week at 15% off the regular price. What is the sale price of the skates including 13% H.S.T during the 1 week sale?

$$\begin{aligned} \text{Sale Price} &= 85\% \text{ of } 295 \\ &= 0.85 \times 295 \\ &= 250.75 \end{aligned}$$

$$\begin{aligned} &250.75 \times 1.13 \\ &= \$283.35 \end{aligned}$$



19. If the grid represents 1% shade the

part that equals $\frac{2}{5}\%$

$$\frac{2}{5}\% = 0.4\%$$

20. The value of houses in St. Johns are now 130% of the value in 2004. If a house was valued at \$180 000 in 2004, what would be its value today?

130% of \$180 000

$$= 1.30 \times 180\,000 = \$234,000$$

21. There are 24 students in a math class. The ratio of boys to girls is 5:3? How many girls are in the class?

5 boys } 8 students
3 girls }

$$\frac{5}{3} = \frac{x}{24}$$

$$x = 9 \text{ girls}$$

22. Jane found a good deal on soft drinks. She could buy a 12 packs for \$2.99. She needs 72 cans for her party. Explain how she can calculate the cost.

Since $12 \times 6 = 72$, Cost of 12 x 6 = Cost of 72.

$$\Rightarrow 6 \times 2.99 = \$17.94$$

23. A manufacture claims that a 3.78 L can of paint can cover an area of 200 m².

A. What area can be covered with each litre of paint?

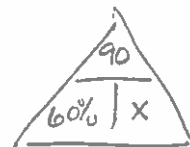
$$\frac{3.78\text{L}}{200\text{m}^2} = \frac{1\text{L}}{52.9\text{m}^2}$$

B. What area can be covered with 7 L of paint?

$$\frac{1\text{L}}{52.9\text{m}^2} \times 7 = \frac{7\text{L}}{370.3\text{m}^2}$$

24. 60% of a number is 90. Use a number line to find the number.

$$90 \div 60\% = 90 \div 0.6 = 150$$



Unit 6: Linear Equations and Graphing

1. Use a model to solve each equation. Verify the solution.

a) $7 + 2x = 1$

b) $3 = 5c - 2$

2. Jack and Diane went to the movies. They each paid the same amount for an admission ticket. Together, they spent \$12 on snacks. The total cost of admission and snacks for Jack and Diane was \$26. How much was each admission ticket?

Write an equation that represents this problem. Then solve it.

$$2t + 12 = 26$$

$$2t + 12 - 12 = 26 - 12$$

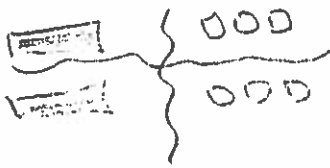
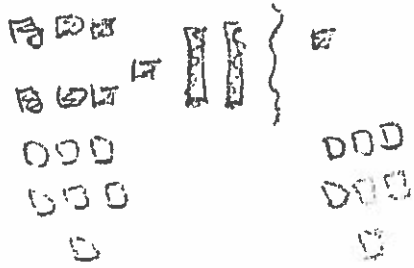
$$2t = 14$$

$$\frac{2t}{2} = \frac{14}{2}$$

$$t = 7$$

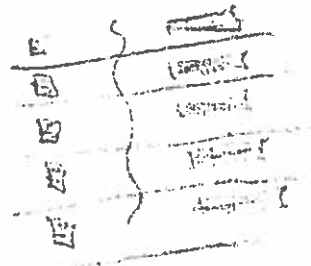
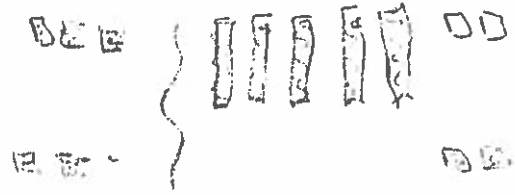
Each ticket was \$7.

1a) $7 + 2x = 1$



$x = -3$

b) $3 = 5c - 2$



$x = 1$

3. Solve each equation.

a) $4x = 32$ b) $-35 = -5p$ c) $-8a + 11 = 27$ d) $6x - 7 = -19$ e) $\frac{n}{3} - 2 = 10$

f) $6f - 15 = -45$ g) $15 = 10 + 2b$ h) $\frac{t}{4} = 7$ i) $\frac{f}{-6} = 10$ j) $-17 + \frac{n}{-3} = 9$ ⇒

4. Write an equation you can use to answer each question. Solve the equation. Verify the solution.

a) Five more than two times a number is 17. What is the number?

$$\begin{aligned} a) \quad & 5 + 2n = 17 \\ & 5 + 2n - 5 = 17 - 5 \\ & \frac{2n}{2} = \frac{12}{2} \\ & n = 6 \end{aligned}$$

$$\begin{aligned} b) \quad & 5n - 6 = 29 \\ & 5n - 6 + 6 = 29 + 6 \\ & \frac{5n}{5} = \frac{35}{5} \\ & n = 7 \end{aligned}$$

b) Six less than five times a number is 29. What is the number?

5. The Grade 8 students had a graduation dinner. They paid a flat rate of \$125 for the use of the hall, plus \$13 for each student who attended. The total cost of the dinner was \$944. How many students attended the dinner?

$$\begin{aligned} 125 + 13n &= 944 \\ 125 - 125 + 13n &= 944 - 125 \\ 13n &= 819 \\ \frac{13n}{13} &= \frac{819}{13} \\ n &= 63 \text{ students} \end{aligned}$$

6. Draw algebra tiles to show that $2(n-5)$ and $2n-10$ are equivalent.

$2(n-5)$ 2 groups of $n-5$



$2n-10$



7. Expand

a) $3(-x+8) = -3x+24$ b) $-4(6-e) = -24+4e$ c) $-3(11y+7) = -33y-21$ d) $7(5n-4) = 35n-28$ e) $-9(-4-7c+10) = 36+63c$

8. Lottery tickets are sold by a local charity to raise money for cancer research. Each ticket costs \$100. Some people pay with a \$100 bill and some pay with a \$100 cheque. Write two expressions you can use to calculate the total amount of money collected. Let b represent the number of \$100 bills received. Let c represent the number of \$100 cheques received.

$$100b + 100c \quad \text{or} \quad 100(b+c)$$

9. Solve each equation: a) $5(a+2) = -5$

$$\begin{aligned} 5a + 10 &= -5 \\ 5a + 10 - 10 &= -5 - 10 \\ \frac{5a}{5} &= \frac{-15}{5} \\ a &= -3 \end{aligned}$$

b) $4(p-6) = -4$

$$\begin{aligned} 4p - 24 &= -4 \\ 4p - 24 + 24 &= -4 + 24 \\ \frac{4p}{4} &= \frac{20}{4} \\ p &= 5 \end{aligned}$$

c) $-5(q-11) = 70$

$$\begin{aligned} -5q + 55 &= 70 \\ -5q + 55 - 55 &= 70 - 55 \\ \frac{-5q}{-5} &= \frac{15}{-5} \\ q &= -3 \end{aligned}$$

$$6a) \frac{4x}{4} = \frac{32}{4}$$

$$x = 8$$

$$b) \frac{-35}{-5} = \frac{-5p}{-5}$$

$$p = 7$$

$$c) 8a + 11 = 27$$

$$8a + 11 - 11 = 27 - 11$$

$$\frac{8a}{8} = \frac{16}{8}$$

$$a = 2$$

$$d) 6x - 7 = 19$$

$$6x - 7 + 7 = 19 + 7$$

$$\frac{6x}{6} = \frac{26}{6}$$

$$x = 4\frac{1}{3}$$

$$e) \frac{n}{3} - 2 = 10$$

$$\frac{n}{3} - 2 + 2 = 10 + 2$$

$$\frac{n}{3} = 12$$

$$\frac{n}{3} \times 3 = 12 \times 3$$

$$n = 36$$

$$f) 6f - 15 = -45$$

$$6f - 15 + 15 = -45 + 15$$

$$\frac{6f}{6} = \frac{-30}{6}$$

$$f = -5$$

$$g) 15 = 10 + 2b$$

$$15 - 10 = 10 + 2b - 10$$

$$\frac{5}{2} = \frac{2b}{2}$$

$$b = 2.5$$

$$h) \frac{t}{4} = 7$$

$$\frac{t}{4} \times 4 = 7 \times 4$$

$$t = 28$$

$$i) \frac{j}{-6} = 10$$

$$\frac{j}{-6} \times -6 = 10 \times -6$$

$$j = -60$$

$$j) -17 + \frac{n}{-3} = 9$$

$$-17 + 17 + \frac{n}{-3} = 9 + 17$$

$$\frac{n}{-3} = 26$$

$$\frac{n}{-3} \times -3 = 26 \times -3 \Rightarrow n = -78$$

10. Scott bought 54 m of fencing to enclose a rectangular plot of land. The width of the rectangular plot is 12 m. Assume Scott uses all the fencing. What is the length of the rectangular plot of land? Choose a variable to represent the length. Write an equation, using the distributive property, and solve it.

$$2(12 + l) = 54$$

$$24 + 2l = 54$$

$$24 - 24 + 2l = 54 - 24$$

$$\frac{2l}{2} = \frac{30}{2}$$

$$l = 15$$

11. Complete a table of values and then graph the equation.

b) $y = -3x + 1$

x	-2	-1	0	1	2
y	7	4	1	-2	-5

a) $y = 2x - 5$

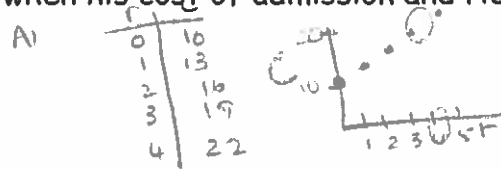
x	-2	-1	0	1	2
y	-9	-7	-5	-3	-1

12. These ordered pairs are in the same linear relation: (-3, -11), (-2, -9), (-1,), (0, -5), (1, -3), (2, 5), (3,)

Find the missing numbers in the ordered pairs. Describe the strategy you used.

13. The cost of admission to a fair is \$10 plus \$3 per ride. An equation for this relation is $C = 10 + 3r$ where r represents the number of rides and C is the cost of admission and r rides.

A) Make a table of values for this relation. B) Graph the relation. C) Describe the relation in words. D) Find the ordered pair on the graph that shows the number of rides Josh went on when his cost of admission and rides was \$22.



c) As the # of rides increase by 1, the cost increases by 3.

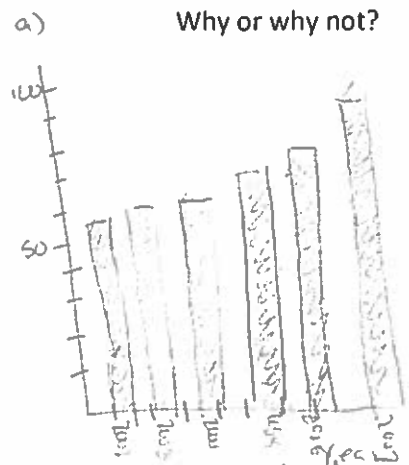
d) (4, 22)

Unit 7: Data Analysis and Probability

1. Here is the enrolment data for the Grade 8 Kitsilano Band Program for 2002-2007.

Band Program Enrolment	
Year	Number of Students
2002	56
2003	60
2004	61
2005	72
2006	80
2007	96

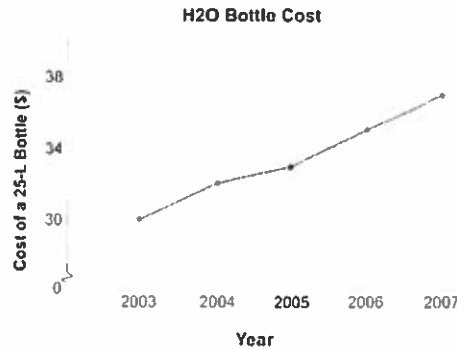
- a) Graph these data. Justify your choice of graph.
- b) What other types of graph could you use to display the data?
- c) Could you use a circle graph to display the data?



b) Circle Graph or Pictograph

c) Yes but you would have to convert to % and be aware of what it would represent

2. These graphs show the cost of a 25-L bottle of water from two suppliers over the past 5 years.



- a) How do the graphs misrepresent the data? *First one has a poor scale. Second does not start at 0.*
- b) What features of the graphs make it seem that the cost of a bottle of water from H2O water company is lower than for Mountain Clear water company? *None. It appears that H2O costs more!*
- c) What features of the graphs make it seem that the cost of a bottle of water from Mountain Clear water company has risen more rapidly than for H2O water company? *None - opposite!*
- d) Which company is more likely to have created these graphs? *Mountain Clear*

3. What is the probability of tossing two coins and having them both show heads?

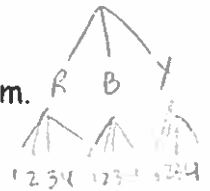
$$P(H, H) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

4. A spinner has 3 congruent sectors coloured red, blue, and yellow. The pointer is spun and a 4-sided die labelled 1, 2, 3, and 4 is rolled.

a) Find the probability of each event: b) Verify your answers using a tree diagram.

i) Landing on red and rolling a 4. ii) Landing on blue and rolling an even number.

iii) Not landing on yellow and rolling an odd number.



i) $P(R, 4) = \frac{1}{3} \times \frac{1}{4} = \frac{1}{12}$ ii) $P(B, \text{even}) = \frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$ iii) $P(\text{not } Y, \text{odd}) = \frac{2}{3} \times \frac{1}{2} = \frac{2}{6} = \frac{1}{3}$

5. An experiment consists of picking a card from a standard deck of playing cards and drawing a counter from a bag that contains 5 counters: 2 blue, 2 white, and 1 red.

Find the probability of each event:

a) Picking a spade and drawing a blue counter.

$$\frac{1}{4} \times \frac{2}{5} = \frac{2}{20} = \frac{1}{10}$$

b) Picking a red card and drawing a red counter.

$$\frac{1}{2} \times \frac{1}{5} = \frac{1}{10}$$

c) Picking a face card and not drawing a white counter.

$$\frac{12}{52} \times \frac{3}{5} = \frac{36}{260} = \frac{9}{65}$$

d) Picking a diamond and drawing a green counter.

$$\frac{1}{4} \times 0 = 0$$

6. A regular 6-sided die is rolled three times. Find the probability of each event:

a) Three 6s in a row

$$\frac{1}{6} \times \frac{1}{6} \times \frac{1}{6} = \frac{1}{216}$$

b) 5, 1, even

$$\frac{1}{6} \times \frac{1}{6} \times \frac{1}{2} = \frac{1}{72}$$

c) Odd, greater than 2, 5

$$\frac{1}{2} \times \frac{4}{6} \times \frac{1}{6} = \frac{4}{72} = \frac{1}{18}$$

7. Each time Parker shoots a free throw in basketball, he has an 80% chance of making the shot. Suppose he is given 3 free throws. Find the probability of each event.

- a) Makes the basket, misses the basket, makes the basket b) Makes all 3 shots
 c) Misses all 3 shots d) Misses the first two shots and makes the third

a) $\frac{8}{10} \times \frac{2}{10} \times \frac{6}{10} = \frac{128}{1000} = \frac{16}{125}$ b) $\frac{8}{10} \times \frac{8}{10} \times \frac{8}{10} = \frac{512}{1000} = \frac{64}{125}$ c) $\frac{2}{10} \times \frac{2}{10} \times \frac{2}{10} = \frac{8}{1000} = \frac{1}{125}$ d) $\frac{2}{10} \times \frac{2}{10} \times \frac{8}{10} = \frac{32}{1000} = \frac{4}{125}$

8. Gretchen knows the combination to a bank vault lock is two letters followed by two numbers.

- a) What is the probability that Gretchen guesses the combination on her first attempt?
 b) Suppose she knows the combination starts with the letter M.

What is the probability she guesses the combination on her first attempt?

$\frac{1}{26} \times \frac{1}{10} \times \frac{1}{10} = \frac{1}{2600}$

$\frac{1}{26} \times \frac{1}{26} \times \frac{1}{10} \times \frac{1}{10} = \frac{1}{67600}$

9. Karen, Gavin, Nasra, and Ali each have a deck of playing cards.

Each student randomly draws a card from the deck. Find the probability of each event:

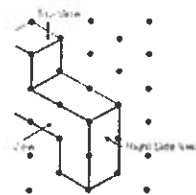
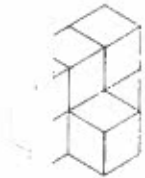
- a) Each student draws a club. $\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} = \frac{1}{256}$
 b) Karen draws a red card, Gavin draws a king, Nasra draws a black card, and Ali draws the 2 of clubs. $\frac{1}{2} \times \frac{4}{52} \times \frac{1}{2} \times \frac{1}{52} = \frac{4}{10816} = \frac{1}{2704}$
 c) Karen draws a heart, Gavin draws a heart, Nasra draws a face card, and Ali draws an ace.

$\frac{1}{4} \times \frac{1}{4} \times \frac{12}{52} \times \frac{4}{52} = \frac{48}{43264} = \frac{3}{2704}$

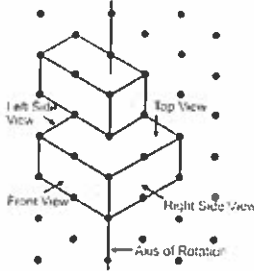
$\frac{1}{4} \times \frac{1}{4} \times \frac{3}{13} \times \frac{1}{13}$

Unit 8: Geometry

1. Sketch the top, front, and side views of each object.



2. Here is an isometric drawing of an object.

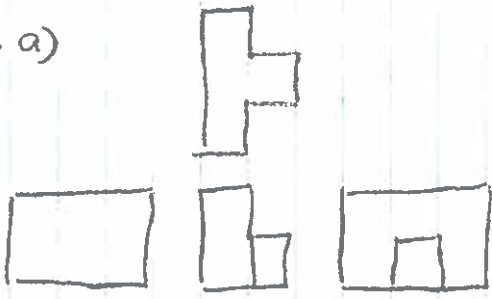


The object is rotated horizontally 270° clockwise about the axis shown.

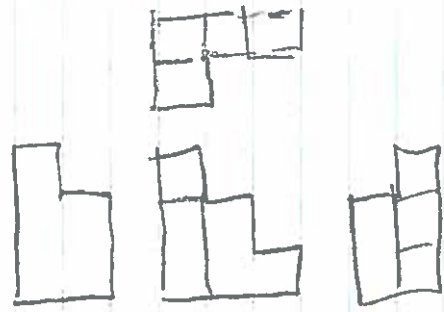
- a) Draw the front, top, and side views of the object after the rotation.
 b) Describe a different rotation that will have the same views as the ones you drew in part a.

90° ccw

1. a)



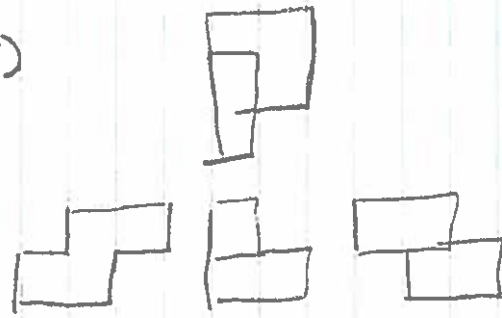
b)



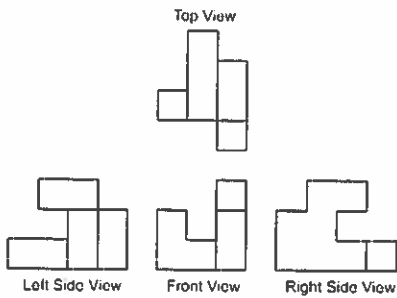
c)



2 a)



3. Use linking cubes to build an object for each set of views below.

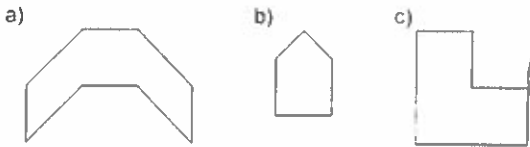


4. Start with the shaded shape. Use transformations to describe how to create Shapes A, B, C, and D.



A: 90° ccw rotation
 B: 180° rotation
 C: Reflection in vertical axis \updownarrow
 D: Translation Right

5. Copy each shape on grid paper. Show one way each shape can be used to tessellate.



Which angles will tessellate?

a) 40° b) 45° c) 50°

Ans

a) Yes
 $9 \times 40^\circ = 360^\circ$

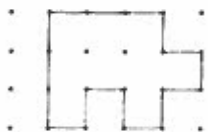
b) Yes
 $8 \times 45^\circ = 360^\circ$

c) No
 $50, 100, 150, 200,$
 $250, 300, 350,$
 $400 \rightarrow$ (cannot)
 make 360° .

6. Draw a hexagon that will not tessellate. Show how it does not tessellate.

Explain why the hexagon does not tessellate. Which shapes will fill the gaps?

7. Use this shape and transformations to create a tessellation on square dot paper.



Describe the tessellation in terms of transformations and conservation of area.