

**Final
Revision
sheet**

**Grade 7
Term 2
2023/2024**

ATS - AQB

PART 1

MULTIPLE CHOICE QUESTIONS

15 Questions

4 Marks each

13. The table shows the scores of two teams in a trivia challenge at the end of the first half. How many more points did the Huskies score than the Bobcats?

Team	Points Scored
Bobcats	$2x - 7$
Huskies	$5x - 3$

$$\begin{aligned}
 &5x - 3 - (2x - 7) \\
 &5x - 3 - 2x + 7 \\
 &\boxed{3x + 4}
 \end{aligned}$$

14. The table shows the sales of plain and Asiago cheese bagels at a bakery for h hours. After 6 hours, how much more will the bakery have made in sales of Asiago cheese bagels than the sales of plain bagels?

Bagel Sales		
Bagel	Cost (\$)	Number Sold After h hours
Asiago Cheese	1.50	$12h + 7$
Plain	1.50	$7h - 4$

$$12h + 7 - (7h - 4)$$

$$12h + 7 - 7h + 4$$

$$5h + 11$$

$$5(6) + 11 = \boxed{41}$$

$$41 \times 1.50 = \boxed{61.50 \$}$$

15. Derek owns a snack shop where he sells tins of buttered and caramel popcorn. The table shows the number of each type of popcorn sold over w weeks. After 12 weeks, how much more will he have made in sales of buttered popcorn than the sales of caramel popcorn?

$$8w + 9 - (6w - 1)$$

$$8w + 9 - 6w + 1$$

$$2w + 10 \Rightarrow w = 12 \text{ weeks}$$

$$2(12) + 10 = 34 \text{ popcorn}$$

$$34 \times 11 = \boxed{374 \$}$$

Popcorn Sales		
Popcorn	Cost (\$)	Number Sold Over w hours
Buttered	11	$8w + 9$
Caramel	11	$6w - 1$

16. Write a real-world problem that could be represented by the equation $6(x + 3.5) = 57$. Then solve the equation.

$$6(x + 3.5) = 57$$

$$6x + \cancel{21} = 57$$

$$\quad \quad \quad -21 \quad -21$$

$$\frac{6x}{6} = \frac{36}{6}$$

$$x = 6$$

17. Find the Error A student is solving $-2(x - 5) = 12$. Find the student's mistake and correct it.

$$-2(x - 5) = 12$$

$$\text{should be } \boxed{10} \quad -2x - 5 = 12$$

$$-2x - 5 + 5 = 12 + 5$$

$$-2x = 17$$

$$x = -8.5$$

$$-2(x - 5) = 12$$

$$-2x + \cancel{10} = 12$$

$$\quad \quad \quad -10 \quad -10$$

$$-2x = 2$$

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

$$x = -1$$

18. Justify Conclusions Suppose for some value of x the solution to the equation $2.5(y - x) = 0$ is $y = 6$. What must be true about x ? Justify your conclusion.

If $2.5(y - x) = 0$, then $(y - x)$ must be 0.

→ If $y = 6$ then x must be equal to 6.

19. Persevere with Problems Solve each equation

a. $2.5(x + 4) + x = 38$

$$\begin{aligned} 2.5x + 10 + x &= 38 \\ 3.5x + 10 &= 38 \\ 3.5x &= 28 \\ \frac{3.5x}{3.5} &= \frac{28}{3.5} \\ X &= 8 \end{aligned}$$

b. $6.1(x - 2) + x = 51.7$

$$\begin{aligned} 6.1x - 12.2 + x &= 51.7 \\ 7.1x - 12.2 &= 51.7 \\ 7.1x &= 63.9 \\ \frac{7.1x}{7.1} &= \frac{63.9}{7.1} \\ X &= 9 \end{aligned}$$

Solve each problem by first writing an inequality.

1. Gabe went to the amusement park with $\$40$ to spend. His ticket cost $\$26.50$. Determine how much Gabe can spend on souvenirs and snacks. Then interpret the solution.

$$\begin{array}{r} 26.50 + x \leq 40 \\ -26.50 \quad -26.50 \\ \hline x \leq 13.50 \end{array}$$

Gabe can spend 13.50 \$ or less on souvenirs and snacks.

2. Drew practices piano at least 45 minutes per day. He has already practiced 18.5 minutes today. Determine how much longer he will have to practice. Then interpret the solution.

$$\begin{array}{r} 18.5 + x \geq 45 \\ -18.5 \quad -18.5 \\ \hline x \geq 26.5 \end{array}$$

Drew will have to practice 26.5 minutes or more.

Solve each problem by first writing an inequality.

3. dolphin is swimming at a depth of -50 feet and then ascends a certain number of feet to a depth above -35 feet. Determine the number of feet the dolphin ascended. Then interpret the solution.

$$\begin{array}{r} -50 + x > -35 \\ +50 \quad +50 \\ \hline x > 15 \end{array}$$

The dolphin ascended more than 15 feet to be above -35 ft.

4. Elena's account balance with her parents is $-\$5.50$. she adds a certain amount of money to her balance by mowing the lawn. Elena now has an account balance less than $\$20$. Determine a possible amount she earned mowing the lawn. Then interpret the solution.

$$\begin{array}{r} -5.50 + x < 20 \\ +5.50 \quad +5.50 \\ \hline x < 25.50 \end{array} \quad \left| \begin{array}{l} \text{an amount less} \\ \text{than } 25.50 \text{ was} \\ \text{added to the} \\ \text{account.} \end{array} \right.$$

Solve each problem by first writing an inequality.

- 5.** Linda has two cats. The difference in weight of her Maine Coon and Siberian is at least 6 pounds. Linda's Siberian has a weight of $8\frac{3}{4}$ pounds. Determine the possible weight of the Maine Coon. Then interpret the solution.

$$x - 8\frac{3}{4} \geq 6$$

$$+ 8\frac{3}{4} \quad + 8\frac{3}{4}$$

$$x \geq 14\frac{3}{4}$$

Maine Coon weight
is at least $14\frac{3}{4}$
pounds.

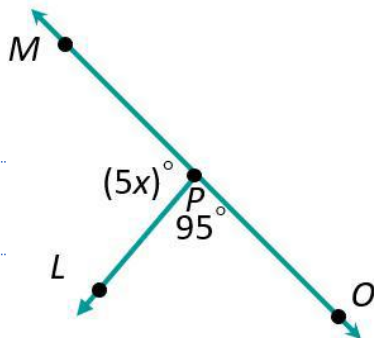
- 6.** The Hendersons have a sedan and a minivan. The difference in mileage of the two vehicles is greater than 4500 miles. The minivan has 12755.25 miles. Determine the possible number of miles on the sedan. Then interpret the solution.

$$x - 12755.25 > 4500$$

$$+ 12755.25 \quad + 12755.25$$

$$x > 17255.25$$

7. Write and solve an equation to find the value of x .

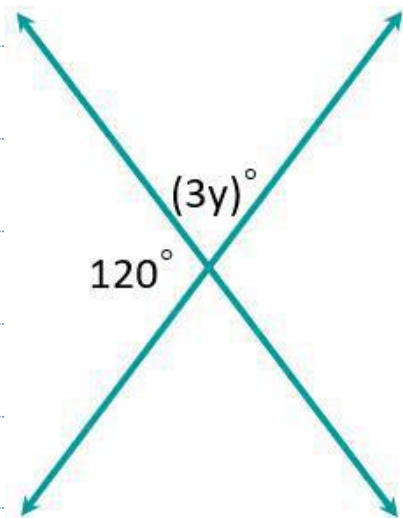


$$\begin{array}{r} 5x + 95 = 180 \\ -95 \quad -95 \\ \hline 5x = 85 \end{array}$$

$$\frac{5x}{5} = \frac{85}{5}$$

$$\boxed{x = 17}$$

8. Write and solve an equation to find the value of y .

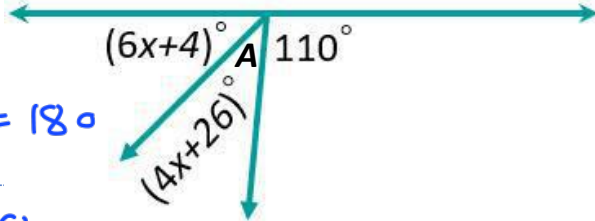


$$\begin{array}{r} 3y + 120 = 180 \\ -120 \quad -120 \\ \hline 3y = 60 \end{array}$$

$$\frac{3y}{3} = \frac{60}{3}$$

$$\boxed{y = 20}$$

9. Levi was designing a kite. He needs to determine the measure of $\angle A$ before cutting the fabric. What is the measure of angle A?



$$6x+4 + 4x+26 + 110 = 180$$

$$10x + 140 = 180$$

$$\quad -140 \quad -140$$

$$\frac{10x}{10} = \frac{40}{10}$$

$$x = 4$$

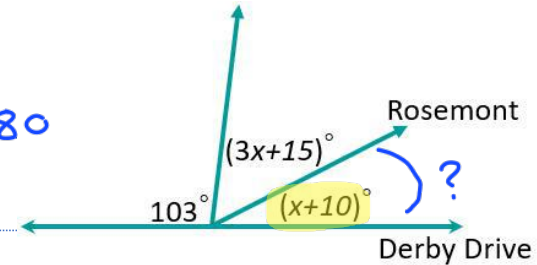
m $\angle A$ is

$$4x+26$$

$$4(4)+26$$

$$16+26 = 42^\circ$$

10. Jess was drawing a map of her neighborhood. What is the measure of the angle of the intersection between Derby Drive and Rosemont?



$$103 + 3x + 15 + x + 10 = 180$$

$$4x + 128 = 180$$

$$\quad -128 \quad -128$$

$$\frac{4x}{4} = \frac{52}{4}$$

$$x = 13$$

Angle of the intersection

$$x+10 \Rightarrow 13+10 = 23^\circ$$

Simplify each expression. For Exercises 1 – 4 and 9 write your answer in factored form.

1. $3(x + 4) + 5x$

$$3x + 12 + 5x$$

$$8x + 12$$

$$4(2x + 3)$$

2. $-4(x + 1) + 6x$

$$-4x - 4 + 6x$$

$$2x - 4$$

$$2(x - 2)$$

3. $-5(2x - 6) + 25x$

$$-10x + 30 + 25x$$

$$15x + 30$$

$$15(x + 2)$$

Simplify each expression. For Exercises 1 – 4 and 9 write your answer in factored form.

4. $2(-8x - 3) + 18x$

$$-16x - 6 + 18x$$

$$2x - 6$$

$$2(x - 3)$$

5. $\frac{1}{6}x + \frac{3}{4}\left(\frac{1}{2}x - 4\right)$

$$\frac{1}{6}x + \frac{3}{8}x - 3$$

$$\frac{13}{24}x - 3$$

$$3\left(\frac{13}{72}x - 1\right)$$

$$\frac{3}{4} \times \frac{1}{2} = \left(\frac{3}{8}\right)$$

$$\frac{3}{4} \times \frac{-4}{1} = \frac{-12}{4} = \boxed{-3}$$

$$\frac{1 \times 4}{6 \times 4} + \frac{3 \times 3}{8 \times 3}$$

$$\frac{4}{24} + \frac{9}{24} = \boxed{\frac{13}{24}}$$

6. $\frac{2}{3}\left(6x - \frac{1}{6}\right) + 3x$

$$4x - \frac{1}{9} + 3x$$

$$7x - \frac{1}{9}$$

$$7\left(x - \frac{1}{63}\right)$$

Simplify each expression. For Exercises 1 – 4 and 9 write your answer in factored form.

7. $\frac{5}{8}x + \frac{1}{2}\left(\frac{1}{4}x + 10\right)$

$$\frac{5}{8}x + \frac{1}{8}x + 5$$

$$\frac{6}{8}x + 5$$

$$\frac{3}{4}x + 5$$

$$5\left(\frac{3}{20}x + 1\right)$$

8. $\frac{2}{5}\left(10x + \frac{3}{4}\right) - 2x$

$$4x + \frac{3}{10} - 2x$$

$$2x + \frac{3}{10}$$

$$2\left(x + \frac{3}{20}\right)$$

9. $\frac{3}{4}(24x + 28) - (4x - 1)$

$$18x + 21 - 4x + 1$$

$$14x + 22$$

$$2(7x + 11)$$

Solve each equation. Check your solution.

1. $5x + 2 = 17$

$$\begin{array}{r} \cancel{-2} \quad -2 \\ 5x + 2 = 17 \\ \hline 5x = 15 \end{array}$$

$$\begin{array}{r} 5x = 15 \\ \hline \cancel{5} \quad 5 \\ x = 3 \end{array}$$

$$\begin{array}{l} 5(3) + 2 = 17 \\ 15 + 2 = 17 \\ 17 = 17 \\ \checkmark \end{array}$$

2. $19 = 4x + 3$

$$\begin{array}{r} -3 \quad \cancel{-3} \\ 19 = 4x + 3 \\ \hline 16 = 4x \end{array}$$

$$\begin{array}{r} 16 = 4x \\ \hline \frac{16}{4} = \frac{4x}{4} \\ x = 4 \end{array}$$

$$\begin{array}{l} 19 = 4(4) + 3 \\ 19 = 16 + 3 \\ 19 = 19 \\ \checkmark \end{array}$$

3. $-18 = 6 + 6x$

$$\begin{array}{r} -6 \quad \cancel{-6} \\ -18 = 6 + 6x \\ \hline -24 = 6x \end{array}$$

$$\begin{array}{r} -24 = 6x \\ \hline \frac{-24}{6} = \frac{6x}{6} \\ -4 = x \end{array}$$

$$\begin{array}{l} -18 = 6 + 6(-4) \\ -18 = 6 + (-24) \\ -18 = -18 \\ \checkmark \end{array}$$

4. $-3x - 9 = -15$

$$\begin{array}{r} \cancel{+9} \quad +9 \\ -3x - 9 = -15 \\ \hline -3x = -6 \end{array}$$

$$\begin{array}{r} -3x = -6 \\ \hline \frac{-3x}{-3} = \frac{-6}{-3} \\ x = 2 \end{array}$$

$$\begin{array}{l} -3(2) - 9 = -15 \\ -6 - 9 = -15 \\ -15 = -15 \\ \checkmark \end{array}$$

5. $-6x - 7 = 17$

$$\begin{array}{r} \cancel{+7} \quad +7 \\ -6x - 7 = 17 \\ \hline -6x = 24 \end{array}$$

$$\begin{array}{r} -6x = 24 \\ \hline \frac{-6x}{-6} = \frac{24}{-6} \\ x = -4 \end{array}$$

$$\begin{array}{l} -6(-4) - 7 = 17 \\ 24 - 7 = 17 \\ 17 = 17 \\ \checkmark \end{array}$$

Solve each equation. Check your solution.

6. $-5 = 3x - 14$

$$+14 \quad +14$$

$$\frac{9}{3} = \frac{3x}{3}$$

$$\boxed{3 = x}$$

$$-5 = 3(3) - 14$$

$$-5 = 9 - 14$$

$$-5 = -5$$



7. $3.8 = 2x - 11.2$

$$+11.2 \quad +11.2$$

$$\frac{15}{2} = \frac{2x}{2}$$

$$\boxed{7.5 = x}$$

$$3.8 = 2(7.5) - 11.2$$

$$3.8 = 15 - 11.2$$

$$3.8 = 3.8$$



8. $5x - 3.3 = 7.2$

$$+3.3 \quad +3.3$$

$$\frac{5x}{5} = \frac{10.5}{5}$$

$$\boxed{x = 2.1}$$

$$5(2.1) - 3.3 = 7.2$$

$$10.5 - 3.3 = 7.2$$

$$7.2 = 7.2$$



9. $1.3x + 1.5 = 5.4$

$$-1.5 \quad -1.5$$

$$\frac{1.3x}{1.3} = \frac{3.9}{1.3}$$

$$\boxed{x = 3}$$

$$1.3(3) + 1.5 = 5.4$$

$$3.9 + 1.5 = 5.4$$

$$5.4 = 5.4$$



Solve each inequality. Graph the solution set on a number line.

1. $-3x - 3 > 12$

$$\begin{array}{r} \cancel{-3x} - \cancel{3} > 12 \\ +3 \quad +3 \end{array}$$

$$\begin{array}{r} \cancel{-3x} > 15 \\ -3 \quad -3 \end{array}$$

$$x < -5$$

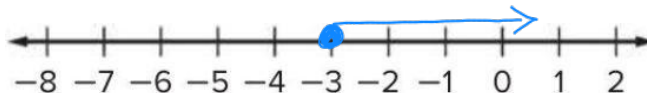


2. $-4 \leq 4x + 8$

$$\begin{array}{r} -4 \leq \cancel{4x} + \cancel{8} \\ -8 \quad -8 \end{array}$$

$$\begin{array}{r} -12 \leq \cancel{4x} \\ 4 \quad 4 \end{array}$$

$$-3 \leq x$$

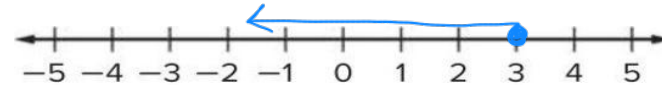


3. $6.5x - 11.3 \leq 8.2$

$$\begin{array}{r} \cancel{6.5x} - \cancel{11.3} \leq 8.2 \\ +11.3 \quad 11.3 \end{array}$$

$$\begin{array}{r} \cancel{6.5x} \leq 19.5 \\ \cancel{6.5} \quad \cancel{6.5} \end{array}$$

$$x \leq 3$$



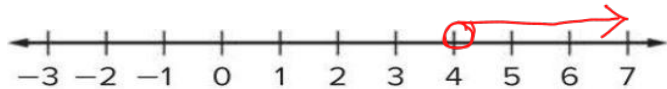
Solve each inequality. Graph the solution set on a number line.

4. $-2.45x + 3.2 < -6.6$

$$\begin{array}{r} -3.2 \quad -3.2 \\ \hline \end{array}$$

$$\begin{array}{r} -2.45x < -9.8 \\ \hline -2.45 \quad -2.45 \end{array}$$

$$x > 4$$



5. $\frac{1}{2}x - \frac{1}{4} \leq \frac{5}{8}$

$$\begin{array}{r} +\frac{1}{4} \quad +\frac{1}{4} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{1}{2}x \leq \frac{7}{8} \\ \hline \frac{1}{2} \quad \frac{1}{2} \end{array}$$

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



$$\begin{array}{r} \frac{5}{8} + \frac{1}{4} \\ \hline \frac{5}{8} + \frac{2}{8} = \frac{7}{8} \end{array}$$

$$\begin{array}{r} \frac{7}{8} \div \frac{1}{2} \\ \hline \frac{7}{8} \times \frac{2}{1} \end{array}$$

$$\begin{array}{r} \frac{14 \div 2}{8 \div 2} = \frac{7}{4} \\ \hline = 1\frac{3}{4} \end{array}$$

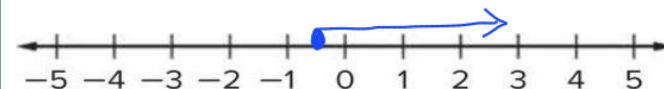
6. $\frac{x}{10} + \frac{1}{4} \geq \frac{1}{5}$

$$\begin{array}{r} -\frac{1}{4} \quad -\frac{1}{4} \\ \hline \end{array}$$

$$\begin{array}{r} \times 10 \quad \times 10 \\ \hline \frac{x}{10} \geq -\frac{1}{20} \end{array}$$

$$x \geq -\frac{1}{2}$$

$$\begin{array}{r} \frac{1}{5} - \frac{1}{4} \\ \hline \frac{4-5}{20} \\ \hline -\frac{1}{20} \end{array}$$



Simplify each expression.

3. $-y + 9z - 16y - 25z + 4$

$$-16z - 17y + 4$$

4. $8z + x - 5 - 9z + 2$

$$-z + x - 3$$

5. $5c - 3d - 12c + d - 6$

$$-7c - 2d - 6$$

Simplify each expression.

6. $-\frac{3}{4}x - \frac{1}{3} + \frac{7}{8}x - \frac{1}{2}$

$$-\frac{3x^2}{4x^2} + \frac{7}{8}$$

$$-\frac{1x^2}{3x^2} - \frac{1x^3}{2x^3}$$

$$-\frac{6}{8} + \frac{7}{8} = \frac{1}{8}$$

$$-\frac{2}{6} - \frac{3}{6} = -\frac{5}{6}$$

$$\frac{1}{8}x - \frac{5}{6}$$

7. $\frac{1}{4} + \frac{9}{10}y - \frac{3}{5}y + \frac{7}{8}$

$$\left(\frac{9}{10} - \frac{3}{5}\right)y + \left(\frac{1}{4} + \frac{7}{8}\right)$$

$$\frac{3}{10}y + \frac{9}{8}$$

$$\frac{3}{10}y + 1\frac{1}{8}$$

8. $-\frac{1}{2}a + \frac{2}{5} + \frac{5}{6}a - \frac{1}{10}$

$$\left(-\frac{1}{2} + \frac{5}{6}\right)a + \left(\frac{2}{5} - \frac{1}{10}\right)$$

$$\frac{1}{3}a + \frac{3}{10}$$

Add.

1. $(8x + 9) + (-6x - 2)$

$$8x + 9 - 6x - 2$$

$$2x + 7$$

2. $(5x + 4) + (-8x - 2)$

$$5x + 4 - 8x - 2$$

$$-3x + 2$$

3. $(-7x + 1) + (4x - 5)$

$$-7x + 1 + 4x - 5$$

$$-3x - 4$$

Add.

4. $(-3x - 9) + (4x + 8)$

$$\text{ } -3x \text{ } -9 \text{ } +4x \text{ } +8 \text{ }$$

$$x - 1$$

5. $(-5x + 4) + (-9x - 3)$

$$\text{ } -5x \text{ } +4 \text{ } -9x \text{ } -3 \text{ }$$

$$-14x + 1$$

6. $(-2x + 10) + (-8x - 1)$

$$\text{ } -2x \text{ } +10 \text{ } -8x \text{ } -1 \text{ }$$

$$-10x + 9$$

Add.

7. $\left(\frac{1}{4}x - 3\right) + \left(\frac{3}{16}x + 5\right)$

$$\frac{1}{4}x - 3 + \frac{3}{16}x + 5$$

$$\frac{7}{16}x + 2$$

8. $\left(\frac{1}{2}x - 3\right) + \left(\frac{1}{6}x + 1\right)$

$$\frac{1}{2}x - 3 + \frac{1}{6}x + 1$$

$$\frac{2}{3}x - 2$$

9. $\left(4x + \frac{3}{4}\right) + \left(-3x - \frac{5}{12}\right)$

$$4x + \frac{3}{4} - 3x - \frac{5}{12}$$

$$x + \frac{1}{3}$$

Add.

10. $\left(-9x - \frac{4}{5}\right) + \left(2x + \frac{2}{3}\right)$

$$-9x - \frac{4}{5} + 2x + \frac{2}{3}$$

$$\boxed{-7x - \frac{2}{15}}$$

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

$$\frac{-12 + 10}{15}$$

$$-\frac{2}{15}$$

11. $\left(\frac{1}{3}x - 3\right) + \left(-\frac{3}{4}x - 5\right)$

$$\frac{1}{3}x - 3 - \frac{3}{4}x - 5$$

$$\boxed{-\frac{5}{12}x - 8}$$

$$\frac{1}{3} - \frac{3}{4}$$

$$\frac{4 - 9}{12}$$

$$-\frac{5}{12}$$

12. $\left(-5x - \frac{2}{3}\right) + \left(-4x - \frac{1}{9}\right)$

$$-5x - \frac{2}{3} - 4x - \frac{1}{9}$$

$$\boxed{-9x - \frac{7}{9}}$$

$$-\frac{2x}{3} - \frac{1}{9}$$

$$-\frac{6}{9} - \frac{1}{9}$$

$$-\frac{7}{9}$$

Factor each expression. If the expression cannot be factored, write cannot be factored

7. $5x + 35$

$$5(x + 7)$$

8. $8x - 14$

$$2(4x - 7)$$

9. $3x + 11y$

can't be
factored.

Factor each expression. If the expression cannot be factored, write cannot be factored

10. $32x - 15$

Can't be
factored.

11. $72x - 18xy$

$$18x(4 - y)$$

12. $45xy - 81y$

$$9y(5x - 9)$$

Factor each expression. If the expression cannot be factored, write cannot be factored.

13. $25x + 14y$

Can't be
factored

14. $\frac{1}{3}x - \frac{1}{3}$

$$\frac{1}{3}(x-1)$$

15. $\frac{1}{2}x + \frac{1}{2}$

$$\frac{1}{2}(x+1)$$

Use the Distributive Property to expand each expression.

9. $2(-3x + 5)$



$$-6x + 10$$

10. $6(-4x + 3y)$



$$-24x + 18y$$


11. $(3y - 2z)5$



$$15y - 10z$$


Use the Distributive Property to expand each expression.

12. $(-2x - 7)4$




$$-8x - 28$$

13. $-7(x - 2)$



$$-7x + 14$$

14. $-3(8x - 4)$



$$-24x + 12$$

Solve each equation. Check your solution.

1. $6 + y = -8$

$\begin{array}{r} -6 \\ -6 \end{array}$

$y = -14$

$6 + (-14) = -8$

$-8 = -8$



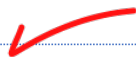
2. $-12 = 4 + c$

$\begin{array}{r} -4 \\ -4 \end{array}$

$-16 = c$

$-12 = 4 + (-16)$

$-12 = -12$



3. $p - 11 = -5$

$\begin{array}{r} +11 \\ +11 \end{array}$

$p = 6$

$6 - 11 = -5$

$-5 = -5$



4. $12 = z - 8$

$\begin{array}{r} +8 \\ +8 \end{array}$

$20 = z$

$12 = 20 - 8$

$12 = 12$



Solve each equation. Check your solution.

13. $c - 5.3 = -6.4$

$$+5.3 \quad +5.3$$

$$c = -1.1$$

$$-1.1 - 5.3 = -6.4$$

$$-6.4 = -6.4$$



14. $-\frac{1}{3} = -\frac{5}{6} + w$

$$+\frac{5}{6} \quad +\frac{5}{6}$$

$$\frac{1}{2} = w$$

$$-\frac{1}{3} = -\frac{5}{6} + \frac{1}{2}$$

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



15. $n + 7.1 = 8.6$

$$-7.1 \quad -7.1$$

$$n = 1.5$$

$$1.5 + 7.1 = 8.6$$

$$8.6 = 8.6$$



Solve each equation. Check your solution.

7. $\frac{d}{-9} = -6$

$$\begin{aligned} \textcircled{\times -9} \frac{d}{-9} &= -6 \quad \textcircled{\times -9} \\ d &= 54 \\ \frac{54}{-9} &= -6 \\ -6 &= -6 \\ \checkmark \end{aligned}$$

8. $15 = \frac{z}{-8}$

$$\begin{aligned} \times \textcircled{-8} \quad 15 &= \frac{z}{-8} \times \textcircled{-8} \\ -120 &= z \\ 15 &= \frac{-120}{-8} \\ 15 &= 15 \\ \checkmark \end{aligned}$$

9. $2\frac{4}{5}x = -1\frac{1}{4}$

$$\begin{aligned} \frac{2\frac{4}{5}}{2\frac{4}{5}} \quad \frac{-1\frac{1}{4}}{2\frac{4}{5}} \\ x &= \frac{-25}{56} \\ -1\frac{1}{4} \div 2\frac{4}{5} \\ -\frac{5}{4} \div \frac{14}{5} \\ -\frac{5}{4} \times \frac{5}{14} \\ -\frac{25}{56} \\ 2\frac{4}{5} \left(\frac{-25}{56} \right) &= -1\frac{1}{4} \\ -1\frac{1}{4} &= -1\frac{1}{4} \\ \checkmark \end{aligned}$$

Solve each equation. Check your solution.

10. $-6 = \frac{3}{5}y$

$$\times \left(\frac{5}{3}\right) \quad -6 = \frac{3}{5}y \quad \times \left(\frac{5}{3}\right)$$

$$\boxed{-10 = y}$$

$$-6 = \frac{3}{5}(-10)$$

$$-6 = -6$$



11. $\frac{-6}{0.2} = \frac{0.2b}{0.2}$

$$\boxed{-30 = b}$$

$$-6 = 0.2(-30)$$

$$-6 = -6$$



12. $\frac{-0.8n}{-0.8} = \frac{2.8}{-0.8}$

$$\boxed{n = -3.5}$$

$$-0.8(-3.5) = 2.8$$

$$2.8 = 2.8$$



1. Easton went to a concert with some of his friends. The tickets cost \$29.50 each, and they spent a total of \$15 on parking. The total amount spent was \$133. Determine how many people went to the concert.

$$29.50x + 15 = 133$$

$$\begin{array}{r} -15 \\ -15 \end{array}$$

$$\begin{array}{r} 29.50x = 118 \\ \hline 29.50 \end{array} \quad \boxed{x = 4}$$

people

2. Ishi bought a \$6.95 canvas and 8 tubes of paint. She spent a total of \$24.95 on the canvas and paints. Determine the cost of each tube of paint.

$$8p + 6.95 = 24.95$$

$$\begin{array}{r} -6.95 \\ -6.95 \end{array}$$

$$\begin{array}{r} 8p = 18 \\ \hline 8 \end{array}$$

$$p = 2.25 \$$$

3. A taxi service charges \$1.50 plus \$0.60 per mile for a trip to the airport. The total charge is \$13.50. determine how many miles it is to the airport.

$$\begin{array}{r} \cancel{1.50} + 0.60M = 13.50 \\ - \cancel{1.50} \quad - 1.50 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{0.60}M = 12 \\ \hline \cancel{0.60} \quad \cancel{0.60} \end{array}$$

$$M = 20 \text{ miles}$$

4. At the market, Meyer buys a bunch of bananas for \$0.65 per pound and a frozen pizza for \$4.99. the total for his purchase was \$6.94, without tax. Determine how many pounds of bananas Meyer bought.

$$\begin{array}{r} 0.65P + \cancel{4.99} = 6.94 \\ - \cancel{4.99} \quad - 4.99 \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{0.65}P = 1.95 \\ \hline \cancel{0.65} \quad \cancel{0.65} \end{array}$$

$$P = 3 \text{ pounds of bananas.}$$

5. A hot air balloon is at an altitude of $100\frac{1}{5}$ yards. The balloon's altitude decreases by $10\frac{4}{5}$ yards every minute. Determine the number of minutes it will take the balloon to reach an altitude of 57 yards.

$$\cancel{100.2} - 10.8y = 57$$

$$\cancel{-100.2} \qquad -100.2$$

$$\frac{\cancel{-10.8}y = -43.2}{\cancel{-10.8} \qquad -10.8}$$

$$\boxed{y=4} \text{ minutes}$$

6. The current temperature is 48°F . It is expected to drop 1.5°F each hour. Determine in how many hours the temperature will be 36°F .

$$\cancel{48} - 1.5h = 36$$

$$\cancel{-48} \qquad -48$$

$$\frac{\cancel{-1.5}h = -12}{\cancel{-1.5} \qquad -1.5}$$

$$\boxed{h=8} \text{ hours}$$

7. Mariko and her friend spent \$24.50 on lunch. Their lunches cost the same amount, and they used a \$4 off coupon. Determine the cost of each lunch.

$$\begin{array}{r} 2L - 4 = 24.50 \\ +4 \quad +4 \end{array}$$

$$\begin{array}{r} 2L = 28.50 \\ \hline 2 \end{array}$$

$$L = 14.25 \$$$

Write two-step equations of the form $p(x + q) = r$ and use inverse operations to solve the equations.

Write and solve an equation for each exercise. Check your solution.

1. Ayana is making 6 scarves that each require $1\frac{1}{4}$ yards of purple fabric and a certain amount of blue fabric. She will use 10 yards in all. Determine how many yards of blue fabric are needed for each scarf.

$$\begin{aligned}
 6(1\frac{1}{4} + b) &= 10 \\
 6 \cdot 1\frac{1}{4} + 6b &= 10 \\
 7\frac{1}{2} + 6b &= 10 \\
 -7\frac{1}{2} & \quad -7\frac{1}{2} \\
 \hline
 6b &= 2.5 \\
 \frac{6b}{6} &= \frac{2.5}{6} \\
 b &= \frac{25 \div 5}{60 \div 5} \\
 b &= \frac{5}{12} \text{ yards}
 \end{aligned}$$

2. Sara is making 3 batches of chocolate chip cookies and 3 batches of oatmeal cookies. Each batch of chocolate chip cookies uses $2\frac{1}{4}$ cups of flour. She will use $12\frac{3}{4}$ cups of flour for all six batches. Determine how many cups of flour are needed for each batch of oatmeal cookies.

$$\begin{aligned}
 3(2\frac{1}{4} + x) &= 12\frac{3}{4} \\
 3 \cdot 2\frac{1}{4} + 3x &= 12\frac{3}{4} \\
 6\frac{3}{4} + 3x &= 12\frac{3}{4} \\
 -6\frac{3}{4} & \quad -6\frac{3}{4} \\
 \hline
 3x &= 6 \\
 \frac{3x}{3} &= \frac{6}{3} \\
 x &= 2 \text{ cups of flour}
 \end{aligned}$$

Write and solve an equation for each exercise. Check your solution.

3. Pete is making 8 identical fruit baskets as gifts. Each basket contains some apples and 12 oranges. Pete uses a total of 168 pieces of fruit to make the baskets. Determine the number of apples that are in each basket.

$$\begin{aligned}
 8(a + 12) &= 168 \\
 8a + \cancel{96} &= 168 \\
 \quad \quad \quad \cancel{-96} \quad \quad \quad \cancel{-96} \\
 8a &= 72 \\
 \frac{8a}{8} &= \frac{72}{8} \\
 a &= 9
 \end{aligned}$$

a = 9
apples

4. A teacher is making 7 identical supply boxes for each table in her classroom. Each box contains some pencils and 11 pens. The teacher uses a total of 182 pencils and pens. Determine the number of pencils that are in each box.

$$\begin{aligned}
 7(p + 11) &= 182 \\
 7p + \cancel{77} &= 182 \\
 \quad \quad \quad \cancel{-77} \quad \quad \quad \cancel{-77} \\
 7p &= 105 \\
 \frac{7p}{7} &= \frac{105}{7} \\
 p &= 15
 \end{aligned}$$

p = 15
pencils

Write and solve an equation for each exercise. Check your solution.

5. Javier bought 3 bags of balloons for a party. He used 8 balloons from each bag. Determine how many balloons were originally in each bag if there were 21 balloons left over.

$$\begin{array}{rcl}
 3(x - 8) & = & 21 \\
 3x - \cancel{24} & = & 21 \\
 \quad \quad \quad \cancel{+24} \quad \quad \quad \cancel{+24} & & \\
 3x & = & 45 \\
 \frac{3x}{3} & = & \frac{45}{3} \\
 x & = & 15
 \end{array}$$

balloons

6. Vera and her three sisters received the same amount of money to go to the school festival. Each girl spent \$12. Afterward, the girls had \$24 altogether. Determine the amount of money each girl received.

$$\begin{array}{rcl}
 4(x - 12) & = & 24 \\
 4x - \cancel{48} & = & 24 \\
 \quad \quad \quad \cancel{+48} \quad \quad \quad \cancel{+48} & & \\
 4x & = & 72 \\
 \frac{4x}{4} & = & \frac{72}{4} \\
 x & = & 18 \$
 \end{array}$$

each girl recieved \$ 18

Write and solve an equation for each exercise. Check your solution.

7. Zak buys 6 gallons of fruit punch. He has coupons for \$0.55 off the regular price of each gallon of fruit punch. After using the coupons, the total cost of the fruit punch is \$8.70. Determine the regular price of a gallon of fruit punch.

$$\cancel{6}(x - 0.55) = 8.70$$

$$\cancel{x - 0.55} = 1.45$$

$$\cancel{+ 0.55} \quad + 0.55$$

$$x = 2$$

regular price
was \$ 2 per
gallon.

8. Open Response Mrs. James buys 5 hat and glove sets for charity. She has coupons for \$1.50 off the regular price of each set. After using the coupons, the total cost is \$48.75. Determine the regular price of a hat and glove set.

Item	Cost(\$)
Hat and gloves set	p
Scarf	9.99

$$5(p + 9.99) - 1.50 = 48.75$$

$$5p + 49.95 - 1.50 = 48.75$$

$$5p + 48.45 = 48.75$$

$$-48.45 \quad -48.45$$

$$\cancel{5}p = 0.30$$

$$\cancel{5} \quad \cancel{5}$$

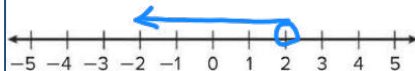
$$p = 0.06 \text{ \$}$$

Solve each inequality. Graph the solution set on a number line.

1. $x + 5 < 7$

$$\begin{array}{r} x + 5 < 7 \\ -5 \quad -5 \end{array}$$

$$x < 2$$



2. $1 > x + 6$

$$\begin{array}{r} 1 > x + 6 \\ -6 \quad -6 \end{array}$$

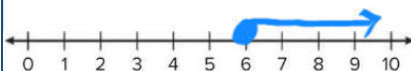
$$1 > x$$



3. $x + 8 \geq 14$

$$\begin{array}{r} x + 8 \geq 14 \\ -8 \quad -8 \end{array}$$

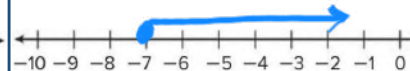
$$x \geq 6$$



4. $5 \leq x + 12$

$$\begin{array}{r} 5 \leq x + 12 \\ -12 \quad -12 \end{array}$$

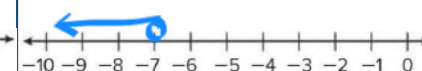
$$-7 \leq x$$



5. $x + 5.4 < -1.6$

$$\begin{array}{r} x + 5.4 < -1.6 \\ -5.4 \quad -5.4 \end{array}$$

$$x < -7$$

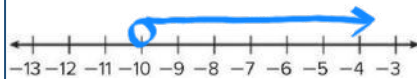


Solve each inequality. Graph the solution set on a number line.

6. $x + 7.5 > -2.5$

$$\begin{array}{r} x + 7.5 > -2.5 \\ -7.5 \quad -7.5 \end{array}$$

$$x > -10$$



7. $3 \leq \frac{1}{3} + x$

$$\begin{array}{r} 3 \leq \frac{1}{3} + x \\ -\frac{1}{3} \quad -\frac{1}{3} \end{array}$$

$$2\frac{2}{3} \leq x$$

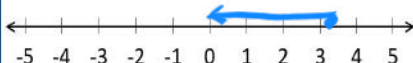
$$\begin{array}{r} \frac{3}{1} - \frac{1}{3} = \frac{9}{3} - \frac{1}{3} \\ = \frac{8}{3} = 2\frac{2}{3} \end{array}$$



8. $4 \geq x + \frac{3}{4}$

$$\begin{array}{r} 4 \geq x + \frac{3}{4} \\ -\frac{3}{4} \quad -\frac{3}{4} \end{array}$$

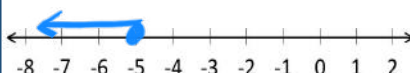
$$3\frac{1}{4} \geq x$$



9. $x - 3 \leq -8$

$$\begin{array}{r} x - 3 \leq -8 \\ +3 \quad +3 \end{array}$$

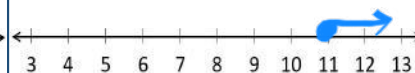
$$x \leq -5$$



10. $4 \leq x - 7$

$$\begin{array}{r} 4 \leq x - 7 \\ +7 \quad +7 \end{array}$$

$$11 \leq x$$



PART 2

FREE RESPONSE QUESTIONS

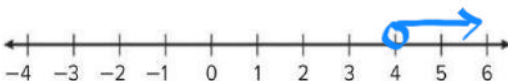
6 Questions

5 TO 10 Marks each

Solve each inequality. Graph the solution set on a number line.

1. $3x > 12$

$$\frac{\cancel{3}x}{\cancel{3}} > \frac{12}{3}$$
$$x > 4$$



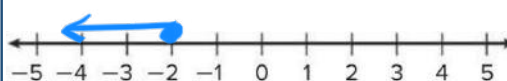
2. $60 \geq 12x$

$$\frac{60}{12} \geq \frac{12x}{12}$$
$$5 \geq x$$



3. $-14 \geq 7x$

$$\frac{-14}{7} \geq \frac{7x}{7}$$
$$-2 \geq x$$



4. $2 \leq 0.25x$

$$\frac{2}{0.25} \leq \frac{0.25x}{0.25}$$
$$\frac{200}{25} \leq x$$
$$8 \leq x$$



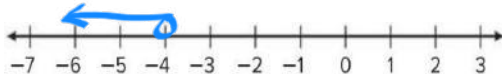
Solve each inequality. Graph the solution set on a number line.

5. $1.1x < -4.4$

$$\frac{1.1x}{1.1} < \frac{-4.4}{1.1}$$

$$x < \frac{-44}{11}$$

$$x < -4$$



6. $\frac{x}{6} \geq 2$

$$\cancel{x \cdot 6} \frac{x}{6} \geq 2 \cdot \cancel{6}$$

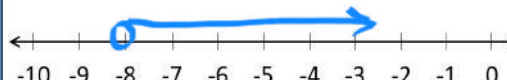
$$x \geq 12$$



7. $\frac{x}{2} > -4$

$$\cancel{x \cdot 2} \frac{x}{2} > -4 \cdot \cancel{2}$$

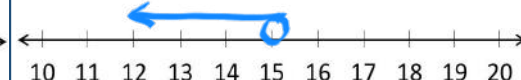
$$x > -8$$



8. $\frac{x}{3} < 5$

$$\cancel{x \cdot 3} \frac{x}{3} < 5 \cdot \cancel{3}$$

$$x < 15$$



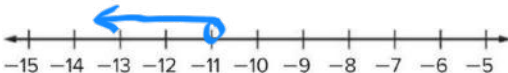
Solve each inequality. Graph the solution set on a number line.

Switch the inequality sign if you \div or \times by negative number

1. $-6x > 66$

$$\frac{-6x}{-6} > \frac{66}{-6}$$

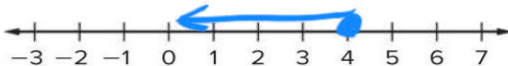
$$x < -11$$



2. $-12 \leq -3x$

$$\frac{-12}{-3} \leq \frac{-3x}{-3}$$

$$4 \geq x$$



3. $-4x \geq -36$

$$\frac{-4x}{-4} \geq \frac{-36}{-4}$$

$$x \leq 9$$

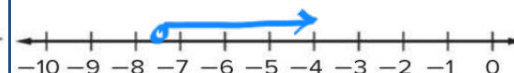


4. $3 > -0.4x$

$$\frac{3}{-0.4} > \frac{-0.4x}{-0.4}$$

$$\frac{30}{-4} < x$$

$$-7.5 < x$$

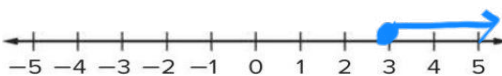


Solve each inequality. Graph the solution set on a number line.

5. $-2.2x \leq -6.6$

$$\frac{-2.2x}{-2.2} \leq \frac{-6.6}{-2.2}$$

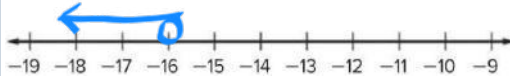
$$x \geq 3$$



6. $\frac{x}{-8} > 2$

$$\cancel{x(-8)} \frac{x}{-8} > 2 \quad \cancel{x(-8)} \frac{x}{-8} > 2 \quad \cancel{x(-8)} \frac{x}{-8} > 2$$

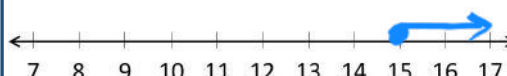
$$x < -16$$



7. $\frac{x}{-5} \leq -3$

$$\cancel{x(-5)} \frac{x}{-5} \leq -3 \quad \cancel{x(-5)} \frac{x}{-5} \leq -3 \quad \cancel{x(-5)} \frac{x}{-5} \leq -3$$

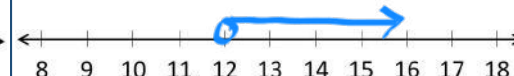
$$x \geq 15$$



8. $\frac{x}{-2} < -6$

$$\cancel{x(-2)} \frac{x}{-2} < -6 \quad \cancel{x(-2)} \frac{x}{-2} < -6 \quad \cancel{x(-2)} \frac{x}{-2} < -6$$

$$x > 12$$



1. Hermes earns \$6 an hour for babysitting. He wants to earn at least \$168 for a new video game system. Determine the number of hours he must babysit to earn enough money for the video game system. Then interpret the solution.

$$\frac{6h}{6} \geq \frac{168}{6}$$

$$h \geq 28$$

* He must babysit at least 28 hours to get the Video game system

2. Becky wants to buy some fish for her aquarium. She has \$20 to spend and the fish cost \$2.50 each. Determine how many fish Becky can afford. Then interpret the solution.

$$\frac{2.5f}{2.5} \leq \frac{20}{2.5}$$

$$f \leq 8$$

* She can buy no more than 8 fish.

3. Sadie wants to make several batches of rolls. She has 13 tablespoons of yeast left in the jar and each batch of rolls takes $3\frac{1}{4}$ tablespoons. Determine the number of batches of rolls Sadie can make. Then interpret the solution.

$$3\frac{1}{4}x < 13$$

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

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

$$\frac{13}{1} \div \frac{13}{4}$$

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

$$x < 4$$

*She can make no more than 4 batches.

4. Trini needs more than 51 cubic feet of soil to fill her raised garden. Each bag of soil contains 1.5 cubic feet. Determine how many bags of soil Trini needs. Then interpret the solution.

$$1.5x > 51$$

$$\frac{1.5x}{1.5} > \frac{51}{1.5}$$

$$\begin{array}{r} 34 \\ 15 \overline{) 510} \\ \underline{-45} \\ 60 \end{array}$$

$x > \frac{510}{15}$ * She needs to buy more than 34 bags of soil for the garden.

5. A teacher is making tutus for the school play. She wants to make at least 24 tutus and needs 1.25 yards of tulle for each tutu. Determine the amount of tulle she needs to buy. Then interpret the solution.

$$\frac{1.25T \geq 24}{1.25} \quad \frac{1.25}{1.25}$$

$$T \geq 19.2$$

* She needs at least 19.2 yards.

$$\begin{array}{r} 19.2 \\ 125 \overline{) 2400} \\ \underline{- 1250} \\ 1150 \\ \underline{1125} \\ 250 \\ \underline{- 250} \\ 0 \end{array}$$

6. Paul is making picture frames. He wants to make at least 8 picture frames and needs 24.5 inches of materials for each frame. Determine how much of the materials Paul should buy. Then interpret the solution.

$$\frac{x \geq 196}{24.5} \quad \frac{x}{24.5} \geq 8 \quad x \geq 196$$

$$x \geq 196$$

* He needs at least 196 inches of the materials.

7. Chase is making bookmarks. He wants to make no more than 12 bookmarks and needs 4.25 inches of fabric for each bookmark. Determine the amount of fabric he needs to buy. Then interpret the solution.

$$x \times \cancel{4.25}^x \frac{x}{\cancel{4.25}} \leq 12 \times \cancel{4.25}$$

$$x \leq 51$$

He needs to buy no more than 51 inches of fabric.

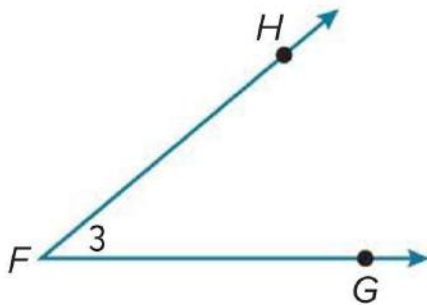
1. Name the angle in four ways.

$\angle F$

$\angle 3$

$\angle HFG$

$\angle GFH$



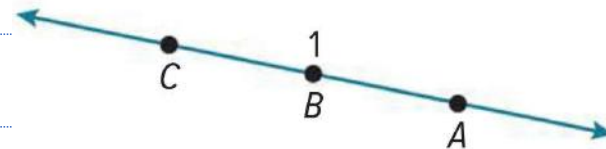
2. Name the angle in four ways.

$\angle 1$

$\angle B$

$\angle CBA$

$\angle ABC$



3. Refer to the diagram below. Identify three pairs of vertical angles. Name all the angles that are adjacent to $\angle 10$

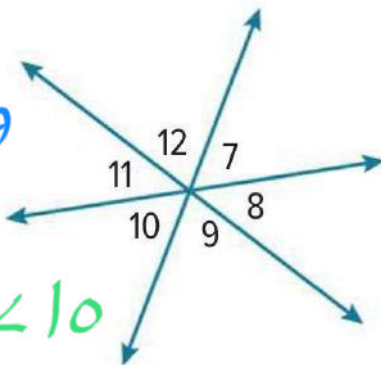
Vertical angles

$\angle 7, \angle 10$ $\angle 12, \angle 9$

$\angle 8, \angle 11$

Angles adjacent to $\angle 10$

$\angle 9, \angle 11$



4. Identify three pairs of vertical angles. Name all the angles that are adjacent to $\angle 3$.

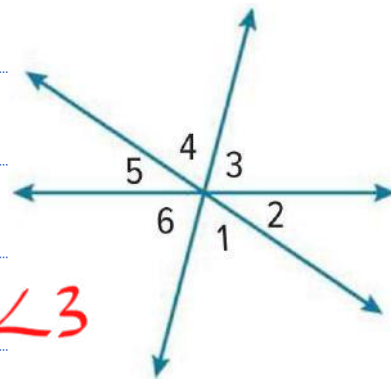
Vertical angles

$\angle 1, \angle 4$ $\angle 3, \angle 6$

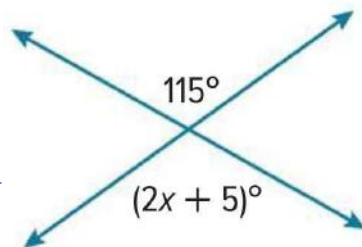
$\angle 2, \angle 5$

Adjacent angles to $\angle 3$

$\angle 2, \angle 4$



5. Write and solve an equation to find the value of x .

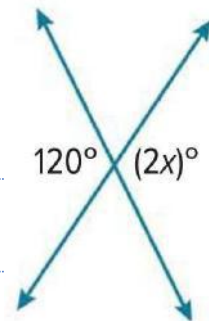


$$2x + 5 = 115$$

$$\frac{2x}{2} = \frac{110}{2}$$

$$x = 55$$

6. Write and solve an equation to find the value of x .



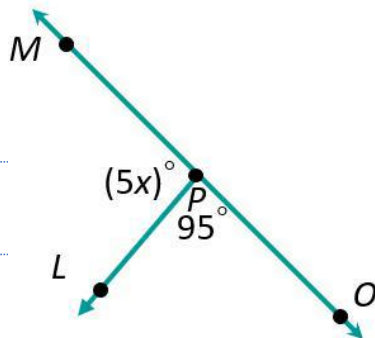
$$\frac{120}{2} = \frac{2x}{2}$$

$$60 = x$$

7. Write and solve an equation to find the value of x .

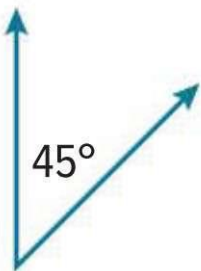
$$\frac{5x}{5} = \frac{95}{5}$$

$$x = 19$$



Give the measure of the angle that is complementary to the given angle.

1.



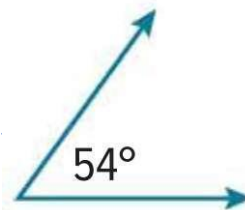
$$90 - 45 = 45^\circ$$

2.



$$90 - 20 = 70^\circ$$

3.



$$90 - 54 = 36^\circ$$

Give the measure of the angle that is ~~complementary~~ to the given angle.
Supplementary

4.



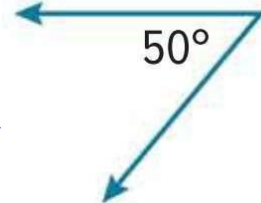
$$180 - 128$$
$$= 52^\circ$$

5.



$$180 - 160$$
$$= 20^\circ$$

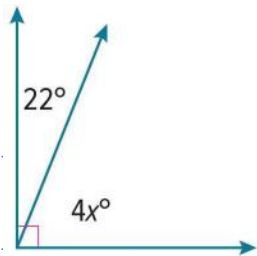
6.



$$180 - 50$$
$$= 130^\circ$$

Write and solve an equation to find the value of x in each figure.

7.



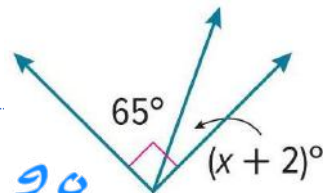
$$4x + 22 = 90$$

$$\begin{array}{r} -22 \\ -22 \end{array}$$

$$\frac{4x}{4} = \frac{68}{4}$$

$$x = 17$$

8.



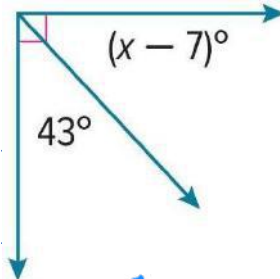
$$x + 2 + 65 = 90$$

$$x + 67 = 90$$

$$\begin{array}{r} -67 \\ -67 \end{array}$$

$$x = 23$$

9.



$$x - 7 + 43 = 90$$

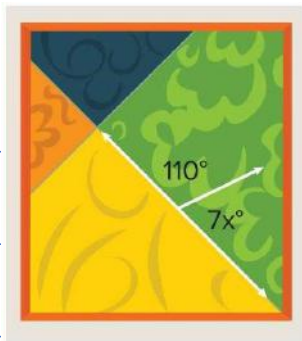
$$x + 36 = 90$$

$$\begin{array}{r} -36 \\ -36 \end{array}$$

$$x = 54$$

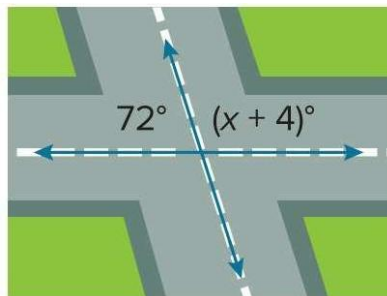
Write and solve an equation to find the value of x in each figure.

10.



$$\begin{array}{r}
 \cancel{110} + 7x = 180 \\
 \cancel{-110} \quad \quad \quad \cancel{-110} \\
 7x = 70 \\
 \boxed{x = 10}
 \end{array}$$

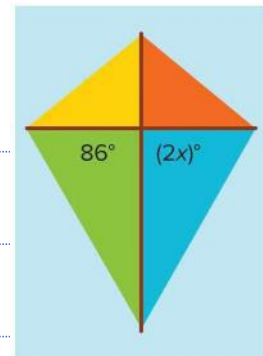
11.



$$\begin{array}{r}
 x + 4 + 72 = 180 \\
 x + \cancel{76} = 180 \\
 \quad \quad \quad \cancel{-76} \quad \quad \quad \cancel{-76} \\
 \boxed{x = 102}
 \end{array}$$

12.

$$\begin{array}{r}
 2x + \cancel{86} = 180 \\
 \quad \quad \quad \cancel{-86} \quad \quad \quad \cancel{-86} \\
 \hline
 2x = 94 \\
 \hline
 \boxed{x = 47}
 \end{array}$$

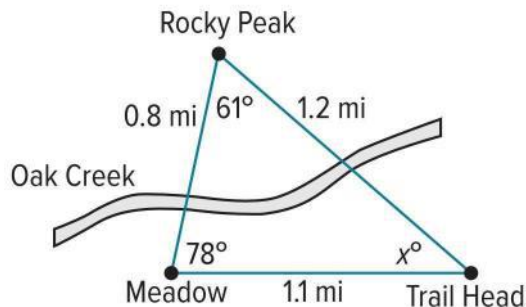


9. The figure shows the Oak Creek trail, which is shaped like a triangle. Solve the equation $61 + 78 + x = 180$ to find the value of x in the figure. Then classify the triangle by its angles and by its sides.

$$61 + 78 + x = 180$$

$$\begin{array}{r} 139 + x = 180 \\ -139 \quad -139 \\ \hline x = 41^\circ \end{array}$$

Acute scalene triangle

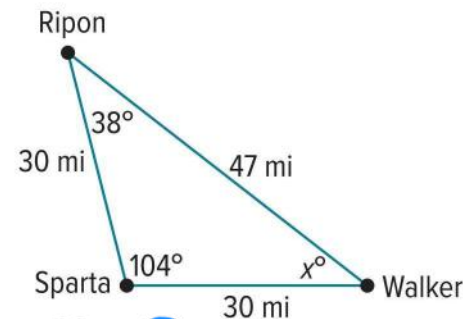


10. The three towns of Ripon, Sparta, and Walker form a triangle as shown. Solve the equation $38 + 104 + x = 180$ to find the value of x in the triangle. Then classify the triangle by its angles and by its sides.

$$38 + 104 + x = 180$$

$$\begin{array}{r} 142 + x = 180 \\ -142 \quad -142 \\ \hline x = 38^\circ \end{array}$$

Obtuse isosceles triangle

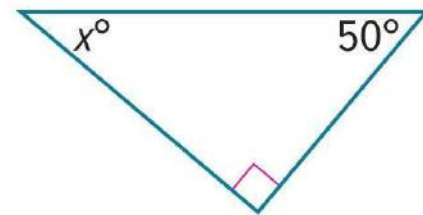


11. Reason Abstractly Without drawing the triangle, how do you know a triangle with a 95° angle, a 95° angle, and a 5-inch side is not possible?

$$95^\circ + 95^\circ = 190^\circ$$

not possible to draw the triangle because the sum of 2 angles is more than 180° .

12. Find the value of x in the diagram. Then, find the supplement of the missing angle.



$$\begin{array}{r} x + 50 = 90 \\ -50 \quad -50 \\ \hline \end{array}$$

$$x = 40^\circ$$

The supplement of an angle with measure 40° is $180 - 40 = 140^\circ$

