Honors Algebra 2/Trigonometry
2020 Summer Math Packet

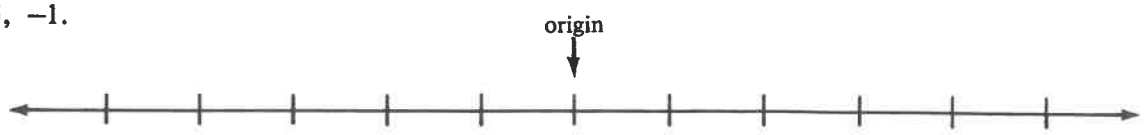
Directions:

Please do your work on a separate sheet of paper. Bring completed work with you to class at the start of the year. Do your best. Know that you will have an opportunity to ask questions if there are problems that you don't know how to do or don't remember fully. There will be a diagnostic assessment in the first few weeks of class, so that your teacher can assess your understanding. The answers are at the end of the document, so check as you go.

NAME_____ DATE_____ SCORE_____

Real Numbers and Their Graphs; Simplifying Expressions

1. On the number line below, graph these numbers: 2, $-4\frac{1}{3}$, 0, 3.5, -1.



Use symbols to write each statement.

2. Five is less than eight _____

3. One-half is greater than zero _____

Tell whether each statement is true or false.

4. $-2 > 1$ _____

5. $0 \neq 5$ _____

6. $|25| = 25$ _____

7. $|-80| = -80$ _____

8. $5 \leq 5$ _____

9. $4\frac{1}{2} > -4\frac{1}{2}$ _____

Find the number that makes each statement true.

10. $3(2 - 5) = 3 \cdot 2 - \underline{?} \cdot 5$ _____

11. $5 \cdot 3^4 = 3^4 \cdot \underline{?}$ _____

12. $7(2 + \underline{?}) = (2 + 1)7$ _____

13. $8 + \underline{?} = 8$ _____

Simplify.

14. $12 - (3 + 1)$ _____

15. $4 - [5 - (3 - 2)]$ _____

16. $5(3^2 - 2^3)$ _____

17. $6 \div 3 \cdot 4$ _____

18. $3 \cdot 2^3 - 6^2 \div 9$ _____

19. $(3 \cdot 5^2 - 10^2 \div 2^2)3^2$ _____

Evaluate each expression if $r = 2$, $s = 5$, and $t = 6$.

20. $r^2s - t$ _____

21. $(t - r)s^2$ _____

22. $\frac{3rs}{t}$ _____

23. $\frac{(s - r)^2}{rt}$ _____

24. $\frac{2s^2 - 2s}{r^5 - 3r^2}$ _____

25. $\frac{3t^2 - 2t + 15}{2s^2 - 3s + 2}$ _____

NAME_____ DATE_____ SCORE_____

Solving Equations in One Variable

Tell whether the given number is a solution of the equation.

1. $5x + 6 = 16; -2$ _____

2. $7a = 15 + 2a; 3$ _____

3. $y(y - 4)(y + 3) = 0; 3$ _____

4. $w^3 - 2w^2 + w - 2 = 0; 2$ _____

5. $\frac{t + 13}{t - 2} = t - 3; -1$ _____

6. $\frac{3c}{3c - 1} = \frac{c + 2}{c - 3}; 1$ _____

Solve. Check your work when there is a single solution.

7. $3a - 11 = 4$ _____

8. $2c + 5 = 3c + 7$ _____

9. $11(e - 1) + 12 = 1$ _____

10. $3(2h + 5) = 5(17 + 4h)$ _____

11. $6(x + 5) - 3x = -2(x - 15) + 5x$ _____

12. $3(2 - a) = 8 - a$ _____

13. $6(2x + 1) - 3(5x + 2) = 0$ _____

14. $4(1 + r) = 7 - 2(1 - 2r)$ _____

15. $\frac{3z}{8} = \frac{1}{5}(2z + 3)$ _____

16. $\frac{1}{5}(3n + 5) = -(\frac{n}{2} + 10)$ _____

17. Solve the formula for the perimeter of a rectangle to determine the length of the rectangle if $P = 22$ cm and $w = 3$ cm.
$P = 2l + 2w$
_____

18. Solve the formula for distance traveled at a constant speed to determine the speed (r) if $d = 125$ km and $t = 2.5$ h.
$d = rt$
_____

Solve the equation for the given variable.

19. $\frac{s + 7}{2} = t + 1$, for s _____

20. $f(e + 3) + 2(f + 1) = 2(f - 1) + 5$, for e _____

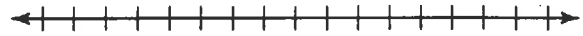
21. $2(3r - s) = 5(s + 2t) - 4(2t + s)$, for r _____

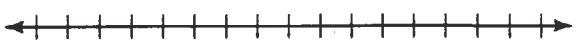
22. $rs - rt = st - sr$, for r _____

NAME_____ DATE_____ SCORE_____

Solving Inequalities in One Variable; Combined Inequalities

Solve each inequality and graph each solution set that is not empty.

1. $3a \leq 9$ _____ 

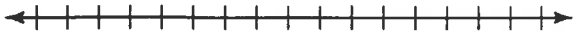
2. $-\frac{2}{3}c > 8$ _____ 

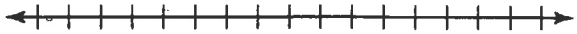
3. $d + 7 \geq 5$ _____ 

4. $5 - 3e \leq -7$ _____ 

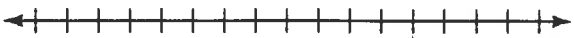
5. $2x + 2 \geq -3x - 3$ _____ 

6. $2 + 3x < 3(x - 1)$ _____ 

7. $2z + 3(z - 1) < 4(z + 1) + 2$ _____ 

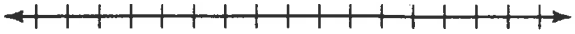
8. $\frac{3s + 1}{5} > \frac{s + 1}{2}$ _____ 

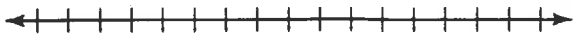
9. $3(t + 1) - 4 > 2(2t + 1) - 1$ _____ 

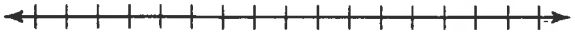
10. $-1 < g + 5 < 3$ _____ 

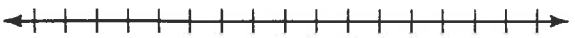
11. $1 \leq 6n < 18$ _____ 

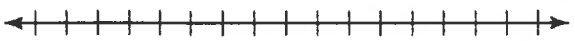
12. $18 > 2(j + 1) > 1$ _____ 

13. $4 < \frac{k + 8}{2} < 7$ _____ 

14. $6 \leq 5 - \frac{q}{2} \leq 8$ _____ 

15. $2 - n \leq 3n$ or $2 - n \leq -3n$ _____ 

16. $2 - 3m < -10$ or $2m + 4 < 10 - m$ _____ 

17. $2(c + 1) - 3 < 1$ or $2(c + 1) - 3 > 19$ _____ 

NAME_____ DATE_____ SCORE_____

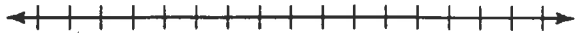
Absolute Value in Open Sentences; Solving Graphically

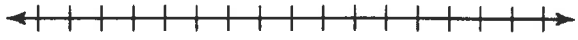
Solve and graph the solution set.

1. $|\frac{3}{5}a| = 6$ _____ 

2. $|y - 0.3| = 0.1$ _____ 

3. $|5(n - 3)| = 10$ _____ 

4. $|2c + 5| > 5$ _____ 

5. $|\frac{s}{3} + \frac{1}{5}| \geq 1$ _____ 

Using absolute value and the variable x, translate each statement into an open sentence.

6. The numbers whose distance from 8 is less than 2 _____

7. The numbers whose distance from 5 is equal to 3 _____

8. The numbers whose distance from -3 is at least 4 _____

9. The numbers whose distance from $\frac{1}{4}$ is more than $\frac{5}{4}$ _____

10. The numbers whose distance from m is no less than z _____

Solve each open sentence graphically.

11. $|t - 3| < \frac{2}{3}$ _____

12. $|2 + 6x| = 4$ _____

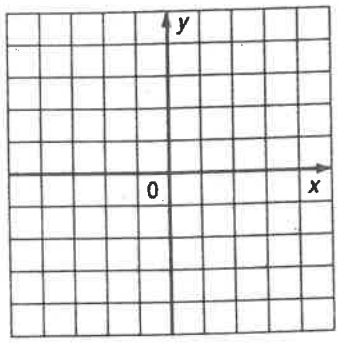
13. $|m - 8| \geq 3$ _____

14. $\frac{3}{5} < |n + 5|$ _____

15. $|-2s - 4| < 4$ _____

16. $10|4 - 0.5r| = 20$ _____

20. Graph $x + y = 2$.



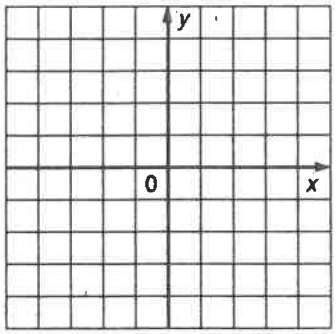
21. Find the slope of the line $3x - 2y = 5$.

22. Find an equation of the line containing the points $(-4, 1)$ and $(2, -3)$.

23. Solve the system: $x + 2y = 4$
$2x + y = -1$

24. Two cartons of milk and one sandwich cost \$3.00, and one carton of milk and two sandwiches cost \$4.20. Find the cost of one carton of milk.

25. Graph the inequality: $x - y < 2$



26. If the function f: $x \to x^2 - x$ has domain $D = \{-1, 0, 1\}$, find the range.

27. Given a linear function f such that $f(2) = 1$ and $f(5) = 7$, find $f(-1)$.

28. Is the relation $\{(-2, 1), (3, 1), (0, 0), (1, -2)\}$ a function?

29. Subtract $4 + 3x - x^2$ from $3x^2 - 2$.

30. Simplify: $2x^2y(-3xy^3)^2$

31. Multiply: $(2x - 3)(4x + 1)$

32. Find (**a**) the GCF and (**b**) the LCM of $24x^3y$ and $18x^2y^2$.

33. Factor: **a.** $9x^2 - 25$ **b.** $x^2 + x - 12$

34. Solve: $2x^2 = 7x + 4$

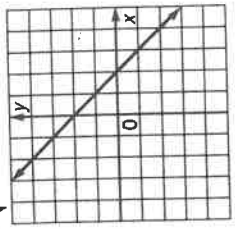
35. Find a number that is 30 less than its square. There are two different answers; give both.

36. Solve: $x^2 + 2x < 8$

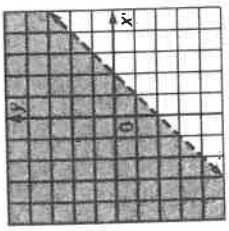
Answers

21. $\frac{3}{2}$ **22.** $2x + 3y = -5$ **23.** $(-2, 3)$ **24.** \$.60

20.



25.

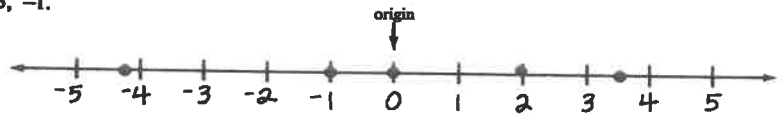


26. $\{0, 2\}$ **27.** -5 **28.** yes **29.** $4x^2 - 3x - 6$ **30.** $18x^4y^7$ **31.** $8x^2 - 10x - 3$ **32.a.** $6x^2y$ **b.** $72x^3y^2$ **33.a.** $(3x - 5)(3x + 5)$ **b.** $(x - 3)(x + 4)$ **34.** $\{-\frac{1}{2}, 4\}$ **35.** 6 or -5 **36.** $\{x: -4 < x < 2\}$

NAME_____ DATE_____ SCORE_____

Real Numbers and Their Graphs; Simplifying Expressions

1. On the number line below, graph these numbers: 2, $-4\frac{1}{3}$, 0, 3.5, -1.



Use symbols to write each statement.

2. Five is less than eight $5 < 8$

3. One-half is greater than zero $\frac{1}{2} > 0$

Tell whether each statement is true or false.

4. $-2 > 1$ F

5. $0 \neq 5$ T

6. $|25| = 25$ T

7. $|-80| = -80$ F

8. $5 \leq 5$ T

9. $4\frac{1}{2} > -4\frac{1}{2}$ T

Find the number that makes each statement true.

10. $3(2 - 5) = 3 \cdot 2 - \underline{?} \cdot 5$ 3

11. $5 \cdot 3^4 = 3^4 \cdot \underline{?}$ 5

12. $7(2 + \underline{?}) = (2 + 1)7$ 1

13. $8 + \underline{?} = 8$ 0

Simplify.

14. $12 - (3 + 1)$ 8

15. $4 - [5 - (3 - 2)]$ 0

16. $5(3^2 - 2^3)$ 5

17. $6 + 3 \cdot 4$ 8

18. $3 \cdot 2^3 - 6^2 + 9$ 20

19. $(3 \cdot 5^2 - 10^2 + 2^2)3^2$ 450

Evaluate each expression if $r = 2$, $s = 5$, and $t = 6$.

20. $r^2s - t$ 14

21. $(t - r)s^2$ 100

22. $\frac{3rs}{t}$ 5

23. $\frac{(s - r)^2}{rt}$ $\frac{3}{4}$

24. $\frac{2s^2 - 2s}{t^3 - 3r^2}$ 2

25. $\frac{3t^2 - 2t + 15}{2s^2 - 3s + 2}$ 3

NAME_____ DATE_____ SCORE_____

Solving Equations in One Variable

Tell whether the given number is a solution of the equation.

1. $5x + 6 = 16; -2$ no

2. $7a = 15 + 2a; 3$ yes

3. $y(y - 4)(y + 3) = 0; 3$ no

4. $w^3 - 2w^2 + w - 2 = 0; 2$ yes

5. $\frac{t + 13}{t - 2} = t - 3; -1$ yes

6. $\frac{3c}{3c - 1} = \frac{c + 2}{c - 3}; 1$ no

Solve. Check your work when there is a single solution.

7. $3a - 11 = 4$ {5}

8. $2c + 5 = 3c + 7$ {-2}

9. $11(e - 1) + 12 = 1$ {0}

10. $3(2h + 5) = 5(17 + 4h)$ {-5}

11. $6(x + 5) - 3x = -2(x - 15) + 5x$ {real numbers}

12. $3(2 - a) = 8 - a$ {-1}

13. $6(2x + 1) - 3(5x + 2) = 0$ {0}

14. $4(1 + r) = 7 - 2(1 - 2r)$ no solution

15. $\frac{3z}{8} = \frac{1}{5}(2z + 3)$ {-24}

16. $\frac{1}{5}(3n + 5) = -(\frac{n}{2} + 10)$ {-10}

17. Solve the formula for the perimeter of a rectangle to determine the length of the rectangle if $P = 22$ cm and $w = 3$ cm.
$P = 2l + 2w$
8 cm

18. Solve the formula for distance traveled at a constant speed to determine the speed (r) if $d = 125$ km and $t = 2.5$ h.
$d = rt$
50 km/h

Solve the equation for the given variable.

19. $\frac{s + 7}{2} = t + 1$, for s $2t - 5$

20. $f(e + 3) + 2(f + 1) = 2(f - 1) + 5$, for e $\frac{-3f + 1}{f}$

21. $2(3r - s) = 5(s + 2t) - 4(2t + s)$, for r $\frac{3s + 2t}{6}$

22. $rs - rt = st - sr$, for r $\frac{st}{2s - t}$

NAME _____ DATE _____ SCORE _____

Solving Inequalities in One Variable; Combined Inequalities

Solve each inequality and graph each solution set that is not empty.

1. $3a \le 9$ $\{a : a \le 3\}$
2. $-\frac{2}{3}c > 8$ $\{c : c < -12\}$
3. $d + 7 \ge 5$ $\{d : d \ge -2\}$
4. $5 - 3e \le -7$ $\{e : e \ge 4\}$
5. $2x + 2 \ge -3x - 3$ $\{x : x \ge -1\}$
6. $2 + 3x < 3(x - 1)$ $\varnothing$
7. $2z + 3(z - 1) < 4(z + 1) + 2$ $\{z : z < 9\}$
8. $\frac{3s + 1}{5} > \frac{s + 1}{2}$ $\{s : s > 3\}$
9. $3(t + 1) - 4 > 2(2t + 1) - 1$ $\{t : t < -2\}$
10. $-1 < g + 5 < 3$ $\{g : -6 < g < -2\}$
11. $1 \le 6n < 18$ $\{n : \frac{1}{6} \le n < 3\}$
12. $18 > 2(j + 1) > 1$ $\{j : 8 > j > -\frac{1}{2}\}$
13. $4 < \frac{k + 8}{2} < 7$ $\{k : 0 < k < 6\}$
14. $6 \le 5 - \frac{q}{2} \le 8$ $\{q : -6 \le q \le -2\}$
15. $2 - n \le 3n$ or $2 - n \le -3n$ $\{n : n \le -1 \text{ or } n \ge \frac{1}{2}\}$
16. $2 - 3m < -10$ or $2m + 4 < 10 - m$ $\{m : m < 2 \text{ or } m > 4\}$
17. $2(c + 1) - 3 < 1$ or $2(c + 1) - 3 > 19$ $\{c : c < 1 \text{ or } c > 10\}$

NAME _____ DATE _____ SCORE _____

Absolute Value in Open Sentences; Solving Graphically

Solve and graph the solution set.

1. $|\frac{3}{5}a| = 6$ $\{-10, 10\}$
2. $|y - 0.3| = 0.1$ $\{0.2, 0.4\}$
3. $|5(n - 3)| = 10$ $\{1, 5\}$
4. $|2c + 5| > 5$ $\{c : c < -5 \text{ or } c > 0\}$
5. $|\frac{s}{3} + \frac{1}{5}| \ge 1$ $\{s : s \le -\frac{18}{5} \text{ or } s \ge \frac{12}{5}\}$

Using absolute value and the variable x, translate each statement into an open sentence.

6. The numbers whose distance from 8 is less than 2 $|x - 8| < 2$
7. The numbers whose distance from 5 is equal to 3 $|x - 5| = 3$
8. The numbers whose distance from -3 is at least 4 $|x + 3| \ge 4$
9. The numbers whose distance from $\frac{1}{4}$ is more than $\frac{5}{4}$ $|x - \frac{1}{4}| > \frac{5}{4}$
10. The numbers whose distance from m is no less than z $|x - m| \ge z$

Solve each open sentence graphically.

11. $|t - 3| < \frac{2}{3}$ $\{t : \frac{7}{3} < t < \frac{11}{3}\}$
12. $|2 + 6x| = 4$ $\{-1, \frac{1}{3}\}$
13. $|m - 8| \ge 3$ $\{m : m \ge 11 \text{ or } m \le 5\}$
14. $\frac{3}{5} < |n + 5|$ $\{n : n < -\frac{28}{5} \text{ or } n > -\frac{22}{5}\}$
15. $|-2s - 4| < 4$ $\{s : -4 < s < 0\}$
16. $10|4 - 0.5r| = 20$ $\{4, 12\}$