Equations and Inequalities Practice

KEY

9. Solve for c: $-4(2c-11)=-28$

$-8c+44=-28$
$-44 \quad -44$
$\frac{-8c}{-8}=\frac{-72}{-8}$
$c=9$

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10. Solve for p: $-59=17-4(6-p)$

$-59=17-24+4p$
$-59=-7+4p$
$+7 \quad +7$
$\frac{-52}{4}=\frac{4p}{4}$
$-13=p$

$p=-13$

11. Solve for x: $6x-19=13x-5$

$-6x \quad -6x$
$-19=7x-5$
$+5 \quad +5$
$\frac{-14}{7}=\frac{7x}{7}$
$-2=x$

$x=-2$

12. Solve for h: $3(3h-10)=2(2h+5)$

$9h-30=4h+10$
$-4h \quad -4h$
$5h-30=10$
$+30 \quad +30$
$\frac{5h}{5}=\frac{40}{5}$
$h=8$

$h=8$

13. Solve for v: $\frac{10-(3v-1)}{5}=9-v$

$5\cdot\frac{10-(3v-1)}{5}=5(9-v)$
$10-3v+1=45-5v$
$11-3v=45-5v$
$+5v \quad +5v$
$11+2v=45$
$-11 \quad -11$
$\frac{2v}{2}=\frac{34}{2}$

$v=17$

14. Solve for a: $\frac{2}{3}(3a-15)=4(2a+5)$

$2a-10=8a+20$
$-2a \quad -2a$
$-10=6a+20$
$-20 \quad -20$
$\frac{-30}{6}=\frac{6a}{6}$
$-5=a$

$a=-5$

15. Simplify the expressions below. You should get the same answer for each expression

a. $-7x+10x+6+9x-3$

$-7x+10x+9x+6-3$
$12x+3$

$12x+3$

b. $5(2.4x+0.6)$

$5\cdot2.4x+5\cdot0.6$

$12x+3$

c. $7(2x-\frac{1}{7})-(2x-4)$

$7\cdot2x-7\cdot\frac{1}{7}-2x+4$
$14x-1-2x+4$
$14x-2x \quad -1+4$
$12x+3$

$12x+3$

For questions 16-17, translate the equation.

16. "Fourteen subtracted from the quotient of a number and 3 is -26."

A. $14-3n=-26$
B. $14-\frac{n}{3}=-26$
C. $\frac{n-14}{3}=-26$
D. $\frac{n}{3}-14=-26$

D

17. "The sum of twice a number and 15 is 9."

A. $2n+15=9$
B. $n^2+15=9$
C. $15n+2=9$
D. $\frac{2n}{15}=9$

A

For questions 18-19, determine which equation could be used to solve the given problem.

18. Mark borrowed \$125 from his Dad to pay some bills. If he has already paid back \$30, how much does he still owe? (let a = amount owed)

A. $a+125=30$
B. $a+30=125$
C. $a-30=125$
D. $a-125=30$

B

19. Eight hot dogs at the baseball park cost \$28. How much does one hot dog cost? (let h = price of one hot dog)

A. $\frac{h}{8}=28$
B. $8+h=28$
C. $28h=8$
D. $8h=28$

D

For questions 20-21, define a variable, set up an equation, then solve. Write the final answer in the box.

20. One-third of the seventh grade class bought tickets for the seventh grade dance. Then, 32 students bought tickets at the door. If there were 158 students at the dance, how many total students are there in the seventh grade?

let x = # students

$\frac{1}{3}x+32=158$
$-32 \quad -32$
$3\cdot\frac{1}{3}x=126\cdot3$
$x=378$

378 students

21. Sadie finished her math test in sixteen minutes less than three times the amount of time it took her friend Laura to finish. If their combined time was 1 hour and 8 minutes, how long did it take Sadie?

let x = Laura's time
let $3x-16$ = Sadie's time

68 min

$x+3x-16=68$
$4x-16=68$
$+16 \quad +16$
$\frac{4x}{4}=\frac{84}{4}$
$x=21$

47 min

Equations & Inequalities Practice KEY

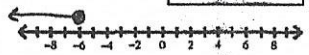
22. Solve and graph: $\frac{x}{3}+17 \le 15$

$-17 \quad -17$

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

$x \le -6$

$x \le -6$



23. Solve and graph: $19 > 23 - 4n$

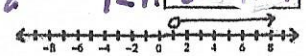
$-23 \quad -23$

$-4 > -4n$

$\frac{-4}{-4} \textcircled{<} \frac{-4n}{-4}$

You must REVERSE the inequality symbol when you multiply or divide by a negative

$1 < n$ or $n > 1$



24. Solve and graph: $-\frac{3}{4}(8k-24) > -12$

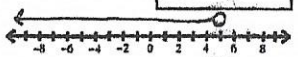
$-6k + 18 > -12$

$-18 \quad -18$

$\frac{-6k}{-6} > \frac{-30}{-6}$

$k < 5$

$k < 5$



25. Solve and graph: $-r + 9 \ge -11 - 6r$

$+6r \quad +6r$

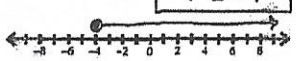
$5r + 9 \ge -11$

$-9 \quad -9$

$\frac{5r}{5} \ge \frac{-20}{5}$

$r \ge -4$

$r \ge -4$



26. Solve: $4(3y-7) \ge 8(y+2)$

$12y - 28 \ge 8y + 16$

$-8y \quad -8y$

$4y - 28 \ge 16$

$+28 \quad +28$

$\frac{4y}{4} \ge \frac{44}{4}$

$y \ge 11$

$y \ge 11$

27. Solve: $2 - 3(m+7) > 1 + 4(m+9)$

$2 - 3m - 21 > 1 + 4m + 36$

$-3m - 19 > 4m + 37$

$-4m \quad -4m$

$-7m - 19 > 37$

$+19 \quad +19$

$\frac{-7m}{-7} > \frac{56}{-7}$

$m < -8$

$m < -8$

28. Which numbers represent solutions to the inequality below? Check all that apply.

$-7 \ge \frac{v-11}{2}$

$2 \cdot -7 \ge \frac{v-11}{2} \cdot 2$

$-14 \ge v - 11$

$+11 \quad +11$

$-3 \ge v$ or $v \le -3$

- ☑ -5
- ☑ -4
- ☑ -3
- ☐ -2
- ☐ -1

29. Which numbers represent solutions to the inequality below? Check all that apply.

$4(2c-3) < 11c + 30$

$8c - 12 < 11c + 30$

$-11c \quad -11c$

$-3c - 12 < 30$

$+12 \quad +12$

$\frac{-3c}{-3} < \frac{42}{-3}$

$c > -14$

- ☐ -17
- ☐ -16
- ☐ -15
- ☐ -14
- ☑ -13

For questions 30-31, translate the inequality.

30. "The difference of a number and 8 is no more than 13."

A. $\frac{n}{8} \le 13$

B. $\frac{n}{8} \ge 13$

C. $n - 8 \le 13$

D. $n - 8 \ge 13$

C

31. "Seventeen more than the product of a number and -3 is less than -29."

A. $\frac{n}{-3} + 17 < -29$

B. $-3n + 17 < -29$

C. $17 > -29 - 3n$

D. $17 > \frac{n}{-3} - 29$

B

For questions 32-33, determine which inequality could be used to solve the given problem.

32. Mrs. Walker would like to give each of her 32 students no less than three stickers. How many stickers must she have? (let s = number of stickers)

A. $32s \le 3$

B. $\frac{s}{32} \le 3$

C. $32s \ge 3$

D. $\frac{s}{32} \ge 3$

D

33. The balance on Lily's credit card is $784. How much money should she send for her next payment if she wishes the balance to be a maximum of $575? (let p = payment amount)

A. $784 - p \le 575$

B. $784 - p \ge 575$

C. $784 + p \le 575$

D. $784 + p \le 575$

A

For questions 34, define a variable, set up an inequality, then solve. Write the final answer in the box.

34. Ethan needs to save at least $500 to purchase a new dirt bike. So far, he has saved $175. If he hopes to use two-fifths of his next paycheck to cover the remaining amount, how much money must he make in his paycheck?

let x = amt of paycheck

$175 + \frac{2}{5}x \ge 500$

$-175 \quad -175$

$\frac{2}{5} \cdot \frac{2}{5}x \ge 325 \cdot \frac{5}{2}$

$x \ge 812.5$

$\ge \$812.50$

BONUS: Solve the equation for x: $\frac{3}{2}\left(\frac{1}{2}x - \frac{10}{3}\right) = \frac{1}{6}(7x+10)$

$\frac{3}{4}x - 5 = \frac{7}{6}x + \frac{5}{3}$

$-\frac{3}{4}x \quad -\frac{3}{4}x$

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

$-\frac{5}{3} \quad -\frac{5}{3}$

$\frac{12}{5} \cdot \frac{-20}{5} = \frac{5}{12}x \cdot \frac{12}{5}$

$-16 = x$

$\frac{7}{6} - \frac{3}{4} \quad -\frac{5}{1} - \frac{5}{3}$

$\frac{14}{12} - \frac{9}{12} \quad -\frac{15}{3} - \frac{5}{3}$

$\frac{5}{12} \quad -\frac{20}{3}$

$x = -16$