Name: Key	Date:
Topic:	Class:

Main Ideas/Questions	Examples

Solving Equations

Basic Steps to Follow	
①	Distribute
②	Simplify Each Side by combining like terms.
③	Move Variables to one side.
④	Solve using inverse operations.

Directions: Solve each equation below.

1. $6(n+5)=2$

$6n+30=2$

$6n=-28$

$\boxed{n=\frac{-14}{3}}$

2. $\frac{3(5-3x)}{-4}=-15$

$\frac{15-9x}{-4}=-15$

$15-9x=60$

$-9x=45$

$\boxed{x=-5}$

3. $2(2-7y)-5=111$

$4-14y-5=111$

$-14y-1=111$

$-14y=112$

$\boxed{y=-8}$

4. $-16=-\frac{15}{16}\left(\frac{4}{5}q+\frac{32}{3}\right)$

$-16=-\frac{3}{4}q-10$

$-6=\frac{-3}{4}q$

$-24=-3q$

$\boxed{8=q}$

5. $10a-7=21-6a$

$16a-7=21$

$16a=28$

$\boxed{a=\frac{7}{4}}$

6. $\frac{5}{6}w+21=-\frac{1}{3}(2w-9)$

$\frac{5}{6}w+21=-\frac{2}{3}w+3$

$5w+126=-4w+18$

$9w+126=18$

$9w=-108$

$\boxed{w=-12}$

7. $-5(8p+6)=5-5p$

$-40p-30=5-5p$

$-35p-30=5$

$-35p=35$

$\boxed{p=-1}$

8. $16-(7m+3)=8(1-m)$

$16-7m-3=8-8m$

$-7m+13=8-8m$

$m+13=8$

$\boxed{m=-5}$

9. $\frac{10x+17-(x-9)}{2}=3x+1$

$10x+17-x+9=6x+2$

$9x+26=6x+2$

$3x+26=2$

$3x=-24$

$\boxed{x=-8}$

10. $\frac{9}{8}\left(4-\frac{1}{2}a\right)=3\left(\frac{1}{4}a+\frac{5}{2}\right)$

$\frac{9}{2}-\frac{9}{16}a=\frac{3}{4}a+\frac{15}{2}$

$\frac{9}{2}=\frac{21}{16}a+\frac{15}{2}$

$-3=\frac{21}{16}a$

$\boxed{\frac{-16}{7}=a}$

Special Cases

11. $1+3c=5(1-c)+8c$

$1+3c=5-5c+8c$

$1+3c=5+3c$

$1\neq 5$

$\boxed{\text{No Solution}}$

12. $40-8x=-8(x-5)$

$40-8x=-8x+40$

$40=40$

$\boxed{\mathbb{R};\ \text{all real numbers}}$

Proportions

13. $\frac{5}{3}=\frac{2}{x+4}$

$5(x+4)=3(2)$

$5x+20=6$

$5x=-14$

$\boxed{x=\frac{-14}{5}}$

14. $\frac{10}{5x-9}=\frac{8}{2x-8}$

$10(2x-8)=8(5x-9)$

$20x-80=40x-72$

$-80=20x-72$

$-8=20x$

$\boxed{\frac{-2}{5}=x}$

Literal Equations

Directions: Solve each equation or formula for the specified variable.

15. $\frac{C}{2r}=\frac{2\pi r}{2r}$ (for π)

$\boxed{\frac{C}{2r}=\pi}$

16. $A=\frac{1}{2}ap$ (for p)

$2A=ap$

$\boxed{\frac{2A}{a}=p}$

17. $\frac{a+b}{c}=5$ (for b)

$a+b=5c$

$\boxed{b=5c-a}$

18. $3x-3y=24$ (for x)

$3(x-y)=24$

$x-y=8$

$\boxed{x=8+y}$

19. $7w=\frac{1}{2}(w+v)$ (for v)

$14w=w+v$

$\boxed{13w=v}$

20. $S=(n-2)\cdot 180$ (for n)

$\frac{S}{180}=n-2$

$\boxed{\frac{S}{180}+2=n}$