

Justify each step for the algebraic proof.

1. Given: $3x - 7 = 20$ Prove: $x = 9$		2. Given: $-20 = -4x - 6x$ Prove: $x = -2$	
	Given	$-20 = -4x - 6x$	
$3x - 7 + 7 = 20 + 7$		$-20 = -10x$	
$3x = 27$	Simplify	$\frac{-20}{-10} = \frac{-10x}{-10}$	
$\frac{3x}{3} = \frac{27}{3}$		$-2 = x$	
$x = 9$	Simplify	$x = -2$	

Solve each equation. Justify each step of the algebraic proof.

3. Given: $8x - 2 = -9 + 7x$ Prove: $x = -7$		4. Given: $24 = -4(5x - 1)$ Prove: $x = -1$	
a.	a.	a.	a.
b.	b.	b.	b.
c.	c.	c.	c.
d.	d.	d.	d.
e.	e.	e.	e.
		f.	f.

4. Given: $\frac{v+9}{3} = 8$ Prove: $v = 15$		4. Given: $-(-12x + 4) - 3x = -7$ Prove: $x = -\frac{1}{3}$	
a.	a.	a.	a.
b.	b.	b.	b.
c.	c.	c.	c.
d.	d.	d.	d.
e.	e.	e.	e.
		f.	f.

Write the letter of the property that justifies each statement.

_____ 5. If $10x + y = 32$ and $y = 3$, then $4x + 3 = 7$	A. Addition Property of Equality
_____ 6. $\angle A = \angle A$	B. Subtraction Property of Equality
_____ 7. If $p = -2$, then $2p = -4$	C. Multiplication Property of Equality
_____ 8. If $6m = 54$, then $m = 9$	D. Division Property of Equality
_____ 9. If $3r = s$, then $s = 3r$	E. Distributive Property
_____ 10. If $\frac{2}{3}h = 14$, then $\frac{2}{3}h - 5 = 14 - 5$	F. Substitution Property
_____ 11. $KL - RL = KR$, then, $KL = KR + RL$	G. Reflexive Property
_____ 12. $t(q + r) = tq + tr$	H. Symmetric Property
_____ 13. If $\angle A + \angle B = \angle C$ and $\angle C = 2\angle D$, then $v\angle A + \angle B = 2\angle D$	I. Transitive Property

Write a two-column proof for each problem.

14. Given: $CD = -13 + 2x$
 $DE = 6$
 $CE = x + 2$

Prove: $x = 9$

Statement	Reason
a.	a. given
b.	b. given
c.	c. given
d. $CD + DE = CE$	d.
e. $-13 + 2x + 6 = x + 2$	e.
f.	f. Simplify
g. $2x - 7 = x + 2$ $-x \quad -x$	g.
h.	h.
g.	g. Addition property of equality
i. $x = 9$	

15. Given: $GF = 3x - 4$
 $GH = 40$

F is the midpoint of GH
 Prove: $x = 8$

Statement	Reason
a.	a. given
b.	b. given
c.	c. given
d. $\overline{GF} \cong \overline{FH}$	d.
e.	e. Definition of congruency
f. $GF + FH = 40$	f.
g. $GF + GF = 40$	g.
h. $3x - 4 + 3x - 4 = 40$	h.
i. $6x - 8 = 40$	i. Simplify
j.	j.
k. $6x = 48$	k. Simplify
l.	l. Division property of equality
m.	m.