EXAM 1/CHAPTER 1-2
80 POINTS POSSIBLE

NAME Key

COEFFICIENTS SHOULD BE INTEGERS OR SIMPLIFIED IMPROPER FRACTIONS
SHOW ALL WORK IN ORDER TO EARN FULL CREDIT
NO DECIMALS UNLESS INDICATED IN THE PROBLEM
BOX YOUR FINAL ANSWER

1. (1 POINT) Determine if -1 is a solution to the equation $6x+12=18$.

Circle One: YES (NO)

$6(-1)+12 \stackrel{?}{=} 18$
$-6+12 \stackrel{?}{=} 18$
$6 \neq 18$

2. (20 POINTS) Perform the indicated operations and simplify. Each part is worth 5 points.

a. $\dfrac{-8^2}{3^3-(21\div 7)} = \dfrac{-64}{27-(3)}$
$= \dfrac{-64}{24}$
$= \boxed{-\dfrac{8}{3}}$

b. $\dfrac{15}{16}\div\left(-\dfrac{4}{3}\right) = \dfrac{15}{16}\cdot\left(-\dfrac{3}{4}\right)$
$= \boxed{-\dfrac{45}{64}}$

c. $\dfrac{7}{12}-\left(-\dfrac{5}{8}\right) = \dfrac{7}{12}\cdot\dfrac{2}{2}+\dfrac{5}{8}\cdot\dfrac{3}{3}$
$= \dfrac{14}{24}+\dfrac{15}{24}$
$= \dfrac{14+15}{24}$
$= \boxed{\dfrac{29}{24}}$

d. $\left(9\dfrac{1}{5}\right)\left(1\dfrac{9}{46}\right)$
$= \left(\dfrac{46}{5}\right)\left(\dfrac{55}{46}\right)$
$= \boxed{11}$

3. (6 POINTS) Translate the English statements into expressions or equations. Each part is worth 3 points.

a. The difference of a number and five increased by eleven.

$\boxed{x-(5+11)}$

b. The quotient of twice a number and 3 is fifteen.

$\boxed{\dfrac{2x}{3}=15}$

4. (10 POINTS) Each part is worth 5 points. Simplify the given algebraic expressions.

a. $1-2(2x-6)-[-7(x-10)]$

$= 1-4x+12-[-7x+70]$

$= 13-4x+7x-70$

$= \boxed{3x-57}$

b. (Decimal is okay)

$0.2(0.1x-0.8)-0.18x$

$= 0.02x-0.16-0.18x$

$= \boxed{-0.16x-0.16}$

5. (6 POINTS) A car rental agency charges $200 per week plus $0.25 per mile. How many miles can you travel in one week for $550? Show all steps—no trial and error. If needed, you may round to the nearest dollar.

(1) Analysis

Let x be the # of miles traveled in one week

(2) Translate

$200+0.25x=550$

(3) Solve

$200+0.25x=550$

$-200 \quad -200$

$0.25x=350$

$\frac{0.25x}{0.25}=\frac{350}{0.25}$

$x=1400$

(4) Conclusion

You can travel 1,400 miles in one week for $550.

6. (6 POINTS) One angle of a triangle is twice as large as another. The measure of the third angle is 40° more than that of the smallest angle. Find the measure of each angle. Show all steps—no trial and error. If necessary, you may round to the nearest tenth of a degree.

(1) Analysis

Let x be the measure of the smallest angle

(2) Translate

$(x)+(2x)+(x+40)=180$

(3) Solve

$x+2x+x+40=180$

$4x+40=180$

$-40 \quad -40$

$\frac{4x}{4}=\frac{140}{4}$

$x=35$

$2x=2(35)=70$

$x+40=35+40=75$

(4) Conclusion

The angles measure 35°, 70°, and 75°.

7. (20 POINTS) Each part is worth 5 points. Solve the equation. Use set notation to identify solutions.

a. $3(x+2)+12=-5$

$3x+6+12=-5$

$3x+18=-5$

$-18 \quad -18$

$\frac{3x}{3} = \frac{-23}{3}$

$x = -\frac{23}{3}$

$\left\{-\frac{23}{3}\right\}$

b. $9x+2=16$

$-2 \quad -2$

$\frac{9x}{9} = \frac{14}{9}$

$x = \frac{14}{9}$

$\left\{\frac{14}{9}\right\}$

c. $2x-1=5(x-4)+8$

$2x-1=5x-20+8$

$2x-1=5x-12$

$+1 \quad +1$

$2x = 5x-11$

$-5x \quad -5x$

$\frac{-3x}{-3} = \frac{-11}{-3}$

$x = \frac{11}{3}$

$\left\{\frac{11}{3}\right\}$

d. $6-(x+5)+1=1-x$

$6-x-5+1=1-x$

$2-x=1-x$

$+x \quad +x$

$2 = 1$ False! No solution!

$\{\}$ or $\emptyset$

8. (2 POINTS) Solve the formula $d = rt$ for t.

$$\frac{d}{r} = \frac{rt}{r}$$

$$\frac{d}{r} = t \rightarrow \boxed{t = \frac{d}{r}}$$

9. (5 POINTS) A pair of boots is on sale for 40% off the original price. The sale price is \$110. What was the original price? You may round to the nearest dollar, if necessary.

(1) Analysis

Let x be the original price

40% off means you pay 60% of original

(2) Translate

$110 = 60\% \cdot x$

(3) Solve

$$\frac{110}{0.60} = \frac{0.60x}{0.60}$$

$$183.3 \approx x$$

(4) Conclusion

The original price of the boots is approximately \$183.

10. (4 POINTS) Solve the inequality, represent the set of solutions in interval and set-builder notation, and graph the solution set.

a. $-2(x-8)-12 \geq -x+7$

$-2x+16-12 \geq -x+7$

$-2x+4 \geq -x+7$

$+x \quad +x$

$-x+4 \geq 7$

$-4 \quad -4$

$(-1)(-x) \geq (3)(-1)$

$x \leq -3$

Interval notation: $(-\infty, -3]$

Set-builder notation: $\{x \mid x \leq -3\}$