Geometry H
Midterm Review Packet 2016-2017

Name : _____Key_____

Date : _____ Period : ____

Algebra Skills Review

Perform the indicated operation.

1. $\dfrac{\frac{1}{5}}{\frac{12}{7}} = \dfrac{1}{5} \cdot \dfrac{7}{12} = \boxed{\dfrac{7}{60}}$

2. $\dfrac{\frac{7}{9}}{\frac{12}{4}} = \dfrac{7}{9} \cdot \dfrac{4}{12} = \dfrac{28}{108} = \dfrac{14}{54} = \boxed{\dfrac{7}{27}}$

3. $\dfrac{2}{21} - \dfrac{1}{2} = \dfrac{4}{42} - \dfrac{21}{42} = \boxed{\dfrac{-17}{42}}$

4. $\dfrac{1}{2} + \dfrac{3}{8} \Rightarrow \dfrac{4}{8} + \dfrac{3}{8} = \boxed{\dfrac{7}{8}}$

Solve for x and y.

5. $\begin{cases} 2x + y = 5 \\ -6x - 3y = -15 \end{cases}$ $\overset{3}{\underset{}{}}$ $\Rightarrow$ $\begin{array}{l} 6x + 3y = 15 \\ -6x - 3y = -15 \\ \hline 0 = 0 \end{array}$

$\boxed{\text{Infinitely many solutions}}$

6. $\begin{cases} 7x + 4y = -5 \\ -2x + 5y = 26 \end{cases}$ $\overset{2}{\underset{7}{}}$ $\Rightarrow$ $\begin{array}{l} 14x + 8y = -10 \\ -14x + 35y = 182 \\ \hline 43y = 172 \\ \boxed{y = 4} \end{array}$

$7x + 16 = -5$
$7x = -21$
$\boxed{x = -3}$

Factor each polynomial completely.

6. $3b^2 - 6b$

$3b(b-2)$

7. $2b^2 + 18b + 16 = 0$

$2(b^2 + 9b + 8) = 0$

$b^2 + 9b + 8 = 0$

$\boxed{(b+8)(b+1)}$

8. $2x^2 + 9x + 4$

$2x^2 + 8x + 1x + 4$

$2x(x+4) + 1(x+4)$

$\boxed{(x+4)(2x+1)}$

9. $5x^2 - 11x - 12 = 0$

$5x^2 - 15x + 4x - 12 = 0$

$5x(x-3) + 4(x-3) = 0$

$\boxed{(5x+4)(x-3)}$

Simplify each radical completely.

10. $\sqrt{192}$

$= \sqrt{64}\sqrt{3}$

$= \boxed{8\sqrt{3}}$

11. $\sqrt{48}$

$= \sqrt{16}\sqrt{3}$

$= \boxed{4\sqrt{3}}$

12. $\sqrt{180}$

$= \sqrt{36}\sqrt{5}$

$= \boxed{6\sqrt{5}}$

$$M = \left(\frac{-8+5}{2}, \frac{9+3}{2}\right) = \left(\frac{-3}{2}, 6\right) = (-1.5, 6)$$
$$\qquad\qquad\qquad x_2 \; y_2$$

$x_1 \; y_1$

13. $\overline{CD}$ has endpoint C(5,3) and D(-8,9). To the nearest tenth, what is the distance, in units, from point C to the midpoint of the segment?

$$CM = \sqrt{(-1.5-5)^2+(6-3)^2} = \sqrt{(-6.5)^2+(3)^2} = \sqrt{42.25+9} = \sqrt{51.25} = \boxed{7.2 \text{ units}}$$

14. $\overline{ET}$ has endpoint E(5,7) and midpoint M (2, -6). Find the coordinates for endpoint T.

$x_1 \; y_1$

$$\frac{x_1+x_2}{2} = M \Rightarrow \frac{5+x_2}{2} = \frac{2}{1} \Rightarrow 4 = 5+x_2 \Rightarrow x_2 = -1 \qquad \frac{y_1+y_2}{2} = M \Rightarrow \frac{7+y_2}{2} = \frac{-6}{1} \Rightarrow -12 = 7+y_2 \Rightarrow y_2 = -19$$

$$\boxed{(-1, -19)}$$

15. $\overline{BD}$ bisects $\angle ABC$. Find the value of x and m$\angle ABC$.
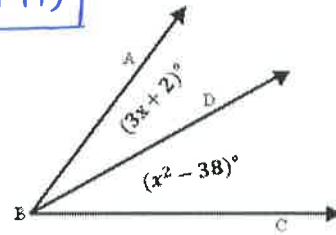
$3x+2 = x^2-38$

$0 = x^2-3x-40$

$0 = (x-8)(x+5)$

$\boxed{x=8} \; x\cancel{=}-5$

m$\angle ABC = 3(8)+2 + (8)^2-38$
$= 24+2+64-38$

$\boxed{m\angle ABC = 52°}$

$(3x+2)°$
$(x^2-38)°$

16. If the $m\angle ABC = 88°$ then, solve for x.
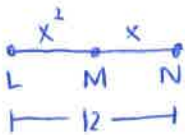
$2x+x-2 = 88$

$3x-2 = 88$

$3x = 90$

$\boxed{x = 30}$

$(2x)°$
$(x-2)°$
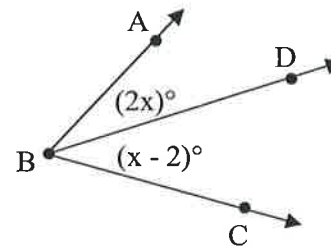
17. Point M is between L and N on $\overline{LN}$. Use the given information to write an equation in terms of x. Solve the equation. Then find LM and MN. LM = x^2, MN= x and LN = 12.

x^2 , x

L   M   N

12

$x^2+x = 12$

$x^2+x-12 = 0$

$(x+4)(x-3) = 0$

$x\cancel{=}4, \; \boxed{x=3}$

$\boxed{LM = 9}$

$\boxed{MN = 3}$

18. The measure of an angle is 28° less than the measure of its complement. Find the measure of the angle and the measure of its complement.

$x = (90-x)-28$

$x = 62-x$

$2x = 62 \Rightarrow x = 31$

$\boxed{\begin{array}{l}\text{The angle} = 31°\\ \text{Its complement} = 59°\end{array}}$

19. The measure of an angle is 12 less than 3 times the measure of its supplement. Find the measure of the angle and the measure of its supplement.
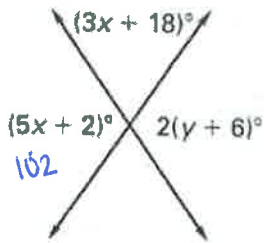
$x = 3(180-x)-12$

$x = 540-3x-12$

$x = 528-3x$

$4x = 528 \Rightarrow x = 132$

$\boxed{\begin{array}{l}\text{The angle} = 132°\\ \text{Its supplement} = 48°\end{array}}$

2

20. Solve for x and y.

$(3x + 18)°$

$(5x + 2)°$ $2(y + 6)°$

102

$5x + 2 + 3x + 18 = 180$

$8x + 20 = 180$

$8x = 160$

$\boxed{x = 20}$

$2y + 12 = 102$

$2y = 90$

$\boxed{y = 45}$

21. Solve for x and y.

$(6x + y)°$

$4x°$

$(x + 5y)°$
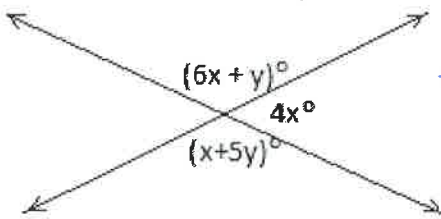
$6x + y = x + 5y$

$\rightarrow 5x - 4y = 0$

$-1 \begin{cases} (5x - 4y = 0) \\ 5x + 5y = 180 \end{cases} \rightarrow \begin{aligned} -5x + 4y = 0 \\ \underline{5x + 5y = 180} \end{aligned}$

$9y = 180$

$\boxed{y = 20}$

$x + 5y + 4x = 180$

$\rightarrow 5x + 5y = 180$

$5x - 4(20) = 0$

$5x = 80$

$\boxed{x = 36}$

22. Given that $\angle CDE$ is a straight angle, please solve for x and find $m\angle CDF$ and $m\angle FDE$.
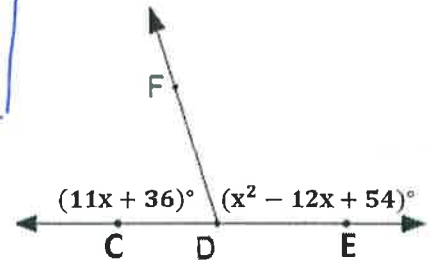
$11x + 36 + x^2 - 12x + 54 = 180$

$x^2 - x + 90 = 180$

$x^2 - x - 90 = 0$

$(x - 10)(x + 9) = 0$

$\boxed{x = 10,} \; x = -9$

$\boxed{\begin{aligned} m\angle CDF &= 11(10) + 36 = 146° \\ m\angle FDE &= (10)^2 - 12(10) + 54 = 34° \end{aligned}}$

F

$(11x + 36)°$ $(x^2 - 12x + 54)°$

C D E

23. Using the diagram on the right, please give two different examples, using correct notation, for each of the following:

Figure	Example 1	Example 2
Segment	$\overline{AC}, \overline{AB}, \overline{BD}$	$\overline{CA}, \overline{BA}, \overline{DB}$
Ray	$\overrightarrow{AC}, \overrightarrow{AB}, \overrightarrow{DB}$	$\overrightarrow{CA}, \overrightarrow{BA}$
Line	$m, n, \overleftrightarrow{AC}, \overleftrightarrow{AB}$	$\overleftrightarrow{CA}, \overleftrightarrow{BA}$

m

A D

B

C n

3