Adv. Geometry S1 Final Review Key

Chapter 1

1. CGB
2. AFG
3. G
4. $\overrightarrow{EG}$ or $\overrightarrow{EF}$
5. $5x-6+2x = 3x+2$

$7x-6 = 3x+2$

$-3x \quad -3x$

$4x-6 = 2$

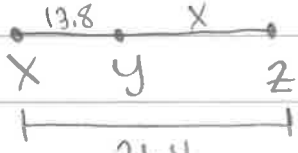
$+6 \quad +6$

$4x = 8$

$x = 2$

$3(2)+2$

RT = 8

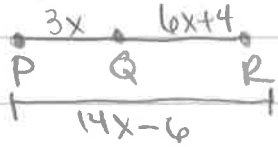
6. 

$13.8 + x = 21.4$

$-13.8 \quad -13.8$

$x = 7.6$

YZ = 7.6

7. 

$3x+6x+4 = 14x-6$

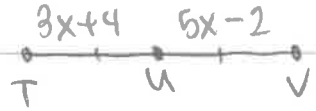
$9x+4 = 14x-6$

$-9x \quad +6 \quad -9x \quad +6$

$14(2)-6 = 22$ **PR = 22**

$\frac{10}{5} = \frac{5x}{5}$

$2 = x$

8. 

$3x+4 = 5x-2$

$-3x \quad -3x$

$4 = 2x-2$

$+2 \quad +2$

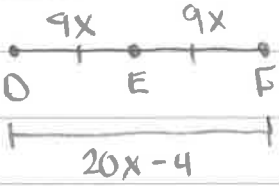
$6 = 2x$

$3 = x$

$3(3)+4 = 13$

TU = UV = 13

TV = 26

9. 

$9x+9x = 20x-4$

$18x = 20x-4$

$-2x = -4$

$x = 2 \quad 9(2) = 18$

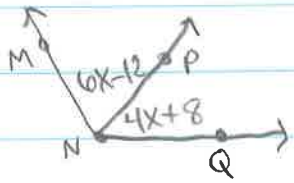
DE = EF = 18

DF = 36

10. a) $\angle XYW$ right
b) $\angle ZYV$ obtuse
c) $\angle XYZ$ acute

11. $13x+20+10x+27=116$
$23x+47=116$
$23x=69$
$x=3$
$13(3)+20=59$
$\boxed{m\angle HJK=59^\circ}$

12.



$6x-12=4x+8$
$2x=20$
$x=10$
$6(10)-12=48$
$48+48=96$
$\boxed{m\angle MNQ=96^\circ}$

13. only adjacent
14. adjacent and linear pair
15. not adjacent
16. $mA+mB=180$
$2x+30+3x-20=180$
$5x+10=180$
$5x=170$
$x=34$
$3(34)-20$
$\boxed{m\angle B=82}$

17. $D=\sqrt{(-2-6)^2+(4-1)^2}$
$=\sqrt{64+9}$
$=\boxed{\sqrt{73}}$

18. $D=\sqrt{(-4-3)^2+(2--2)^2}$
$=\sqrt{49+16}$
$=\boxed{\sqrt{65}}$

19. $\frac{5+-11}{2}$ $\frac{9+3}{2}$
$\boxed{M(-3,6)}$

20. $\frac{3+x}{2}=-1$ $\frac{2+y}{2}=4$
$3+x=-2$ $2+y=8$
$x=-5$ $y=6$
$\boxed{B(-5,6)}$

21. $A(1,1)$ $B(5,1)$ $C(4,-2)$
$AB=4$
$BC=\sqrt{3^2+1^2}$
$BC=3.2$
$AC=\sqrt{3^2+3^2}$
$AC=4.2$
$P=4+3.2+4.2$
$\boxed{P=11.4}$
$A=\frac{1}{2}bh$
$=\frac{1}{2}(4)(3)$
$\boxed{A=6\ units^2}$

Chapter 2

1. a) 81 $(x-3)$
   b) 27 $(+4, +5, +6, \ldots)$
2. $m\angle 1 = m\angle 2 = 45$
3. $m\angle 1 = m\angle 2 = 30$ (any acute $\angle$)
4. a) True
   b) F, $\angle$ could by $20°$
5. If today is Monday, then it is a weekday.
6. conv: If you live in US, then you live in OK (F)
   inv: If you don't live in OK, then you don't live in US. (F)
   contra: If you don't live in US, then you don't live in OK (T)
7. a) F
   b) T
   c) F
8. C
9. a) An angle is right iff its measure is $90°$.
   b) It is Sept. iff the next month is Oct.
10. a)

$\frac{m}{-5} + 3 = -4.5$	given
	Sub POE
$-5 \cdot \frac{m}{-5} = -7.5 \cdot -5$	Mult POE
$\boxed{m = 37.5}$	Simplify

10. b)

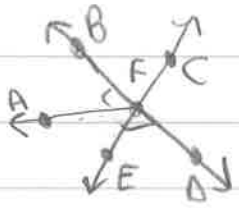
$47 + 3x = 59$	given
$-47 \quad -47$	Sub POE
$\frac{3x}{3} = \frac{12}{3}$	Simp.
	Div POE
$x = 4$	Simp.

11.

given	
Def of comp.	
given	
Def of $\cong$	
Subst.	
Def of comp.	

12. G: $\angle AFB \cong \angle EFD$

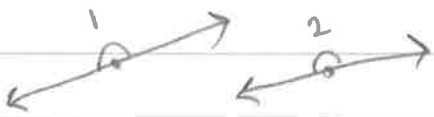
P: $\overrightarrow{FB}$ bisects $\angle AFC$



S	R
$\angle AFB \cong \angle EFD$	given
$\angle EFD \cong \angle BFC$	Vert. $\angle$'s $\cong$ thm
$\angle AFB \cong \angle BFC$	Subst.
$\overrightarrow{FB}$ bisects $\angle AFC$	Def of bisect

13. G: $\angle 1, \angle 2$ Straight $\angle$'s

P: $\angle 1 \cong \angle 2$



S	R
$\angle 1, \angle 2$ St. angles	given
$m\angle 1 = 180$ $m\angle 2 = 180$	Def Straight $\angle$'s
$m\angle 1 = m\angle 2$	Subst
$\angle 1 \cong \angle 2$	Def of $\cong$

Chapter 3

1. $\begin{vmatrix} -2 & -3 \\ -4 & 3 \end{vmatrix} + 6$

$m = 6/-2 = -3$

$-3 = -3(-2) + b$

$-3 = 6 + b$

$-9 = b$

$\boxed{y = -3x - 9}$

2. $\begin{vmatrix} -5 & -5 \\ -3 & -1 \end{vmatrix} + 4$ (+2)

$m = 4/2 = 2$

$-5 = 2(-5) + b$

$-5 = -10 + b$

$5 = b$

$\boxed{y = 2x + 5}$

3. $\parallel m = -7/3 \quad (-3, -1)$

$-1 = -7/3(-3) + b$

$-1 = 7 + b$

$-8 = b$

$\boxed{y = -7/3x - 8}$

4. $\perp m = -2 \quad (-3, -7)$

$-7 = -2(-3) + b$

$-7 = 6 + b$

$-13 = b$

$\boxed{y = -2x - 13}$

5. $\parallel m = 2/5 \quad (3, 7)$

$7 = 2/5(3) + b$

$7 = 6/5 + b$

$29/5 = b$

$\boxed{y = 2/5x + 29/5}$

6. $\perp m = 1/3 \quad (5, -2)$

$-2 = 1/3(5) + b$

$-2 = 5/3 + b$

$-11/3 = b$

$\boxed{y = 1/3x - 11/3}$

7. $\begin{vmatrix} -2 & -3 \\ -4 & 3 \end{vmatrix} + 6$ (−2)

$m = 6/-2 = -3$

midpt. $\frac{-2 + -4}{2} \quad \frac{-3+3}{2}$

$M(-3, 0)$

$\perp m = 1/3$

$0 = 1/3(-3) + b$

$0 = -1 + b$

$1 = b$

$\boxed{y = 1/3x + 1}$

8. $\begin{vmatrix} 5 & 3 \\ -12 & -7 \end{vmatrix} + 4$

$m = \frac{4}{-12} = -1/3$

midpt $\frac{5 + -7}{2} \quad \frac{3+7}{2}$

$M(-1, 5)$

$\perp m = 3$

$5 = 3(-1) + b$

$5 = -3 + b$

$8 = b$

$\boxed{y = 3x + 8}$

9. $x_p = x_1 + t(x_2 - x_1)$
$y_p = y_1 + t(y_2 - y_1)$
$t = 5/8$
$x_p = -1 + 5/8(3 - -1)$
$= 3/2$
$y_p = -2 + 5/8(6 - -2)$
$= 3$
$\boxed{P(3/2, 3)}$

10. $t = 2/3$
$x_p = 2 + 2/3(-1 - 2)$
$= 0$
$y_p = 7 + 2/3(1 - 7)$
$= 3$
$\boxed{P(0, 3)}$

11. HOY
$\boxed{y = -1}$

12. VUX
$\boxed{x = -2}$

13. VUX
$\boxed{x = 2}$

14 HOY
$\boxed{y = -2}$

15. C

16. A

17. F

18. E

19. G

20. D

21. B

22. alt ext $\cong$
$4x - 3 = 3x + 4$
$x = 7$
$4(7) - 3 = 25$
$180 - 25 = 155$
$\boxed{m\angle 2 = 155^\circ}$

23. alt. int $\cong$
$2x + 15 = 5x + 3$
$12 = 3x$
$x = 4$
$2(4) + 15 = 23$
$180 - 23 = 157$
$\boxed{m\angle 2 = 157^\circ}$

24. cons. int $+180$
$3x + 30 + 5x + 22 = 180$
$8x + 52 = 180$
$8x = 128$
$x = 16$
$5(16) + 22 = 102$
$\boxed{m\angle 2 = 102^\circ}$

25. $6x + 10 = 4x + 20$
$2x = 10$
$\boxed{x = 5}$

26. $60 = 6x + 12$

$48 = 6x$

$\boxed{x = 8}$

27. $5x + 12 + 17x - 8 = 180$

$22x + 4 = 180$

$22x = 176$

$\boxed{x = 8}$

28. $x - 18 + x + 12 = 180$

$2x - 6 = 180$

$2x = 186$

$\boxed{x = 93}$

$93 - 18 = 75$

$\boxed{y = 75}$

$180 - 88 = 92$

$\boxed{z = 92}$

29. $3x = 5y - 2x$

$3x + x + 2y = 180$

$3x = 5y - 2x$

$2(5x - 5y = 0)$

$5(4x + 2y = 180)$

$10x - 10y = 0$

$+ \; 20x + 10y = 900$

$30x = 900$

$\boxed{x = 30}$

$5(30) - 5y = 0$

$150 - 5y = 0$

$-5y = -150$

$\boxed{y = 30}$

30. $17x + 18y = 3x + 12y$

$\hookrightarrow 14x + 6y = 0$

$10x + 10y + 17x + 8y = 180$

$27x + 18y = 180$

$-3(14x + 6y = 0)$

$27x + 18y = 180$

$+ \; -42x - 18y = 0$

$-15x = 180$

$\boxed{x = -12}$

$14(-12) + 6y = 0$

$-168 + 6y = 0$

$6y = 168$

$\boxed{y = 28}$

31. $6 = y + 2x$

$y = -2x + 6$

$\perp m = \frac{1}{2}$ $P(4,8)$

$8 = \frac{1}{2}(4) + b$

$8 = 2 + b$

$6 = b$

$y = \frac{1}{2}x + 6$

$-2x + 6 = \frac{1}{2}x + 6$

$-2.5x = 0$

$x = 0$

$y = \frac{1}{2}(0) + 6$

$y = 6$

$P(4,8)$ $(0,6)$

$D = \sqrt{(4-0)^2 + (8-6)^2}$

$= \sqrt{16 + 4}$

$= \sqrt{20}$

$4 \quad 5$

(22)

$\boxed{D = 2\sqrt{5}}$ or $\boxed{4.5}$

32. $y = \frac{1}{4}x - 3$

$\perp m = -4$ $P(-2,1)$

$1 = -4(-2) + b$

$1 = 8 + b$

$-7 = b$

$y = -4x - 7$

$\frac{1}{4}x - 3 = -4x - 7$

$4.25x = -4$

$x = 16/17$ (0.94)

$y = -4(16/17) - 7$

$y = -183/17$ (-10.8)

$(-2,1)$ $(0.94, -10.8)$

$D = \sqrt{(-2-0.94)^2 + (1-(-10.8))^2}$

$= \boxed{12.2}$

33. $(4,2)$ $(8,5)$

reflect x-axis

$(4,-2)$ $(8,5)$

$+4 \left(\begin{array}{c|c} 4 & -2 \\ 8 & 5 \end{array} \right) +7$

$m = \frac{7}{4}$ $(4,-2)$

$-2 = \frac{7}{4}(4) + b$

$-2 = 7 + b$

$-7 \quad -7$

$-9 = b$

$y = \frac{7}{4}x - 9$

Find x-int

$y = \frac{7}{4}x - 9$

$0 = \frac{7}{4}x - 9$

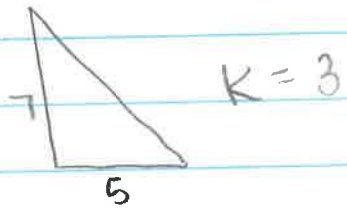
$+9 \qquad +9$

$9 = \frac{7}{4}x$ $x = \frac{36}{7}$

$\frac{7}{4} \quad \frac{7}{4}$ $\boxed{(\frac{36}{7}, 0)}$

Chapter 4

1. $(-2,3) \rightarrow (4,-6)$
   $\frac{4}{-2}$ $\frac{-6}{3}$
   $\boxed{(x,y) \rightarrow (-2x,-2y)}$

2. 

   $7(3) = 21$
   $5(3) = 15$
   $A = \frac{1}{2}(21)(15)$
   $\boxed{A = 157.5 \text{ cm}^2}$

3. $(x,y) \rightarrow (4,-2)$
   $\langle -2, 5 \rangle$
   $\boxed{(6,-7)}$

4. $180° \rightarrow (-x,-y)$
   $\boxed{(x,y) \rightarrow (-\frac{1}{3}x, -\frac{1}{3}y)}$

5. $\boxed{(x,y) \rightarrow (x-4, y+3)}$

6. $\frac{10}{40} = \frac{1}{4} \rightarrow 90° \ (-y,x)$
   $(10,0) \rightarrow \boxed{(0,10)}$

7. a) 5 lines
   $360/5 = 72$
   $\boxed{72°, 144°}$
   b) 4 lines
   $360/4 = 90$
   $\boxed{90°, 180°}$
   c) 6 lines
   $360/6 = 60$
   $\boxed{60°, 120°, 180°}$

8. $100/2 = \boxed{50°}$

9. a) $5(2) = \boxed{10 \text{ cm}}$
   b) $10 - 6 = \boxed{4 \text{ cm}}$
   c) $10 - 8 = \boxed{2 \text{ cm}}$
   d) translation

10. $80(2) = \boxed{160° \text{ rotation}}$

11. a) $27/9 = 3$
    $\boxed{K = 3}$ enlarge
    b) $4/10 = 2/5$
    $\boxed{K = 2/5}$ reduce

12. rigid motion doesn't change size, non-rigid motion size changes

13. $A(5,-3)$
    a) $A'(5,3)$
    b) $A'(-5,-3)$
    c) $A'(-3,5)$
    d) $A'(5,-5)$
    e) $A'(3,5)$
    f) $A'(-5,3)$
    g) $A'(-3,-5)$
    h) $A'(1,5)$
    i) $A'(8,-5)$