

Unit 1 Test Study Guide (Geometry Basics)

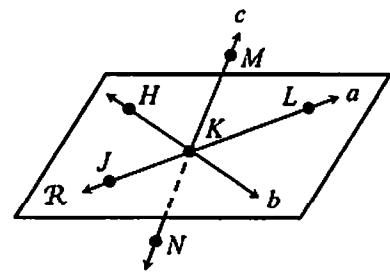
Name: _____

Date: _____ Per: _____

Topic 1: Points, Lines & Planes

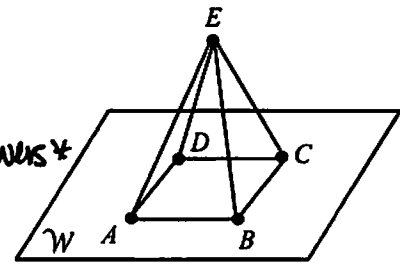
Use the diagram to the right to answer questions 1-4.

- Name two points collinear to point K . J, L
- Give another name for line b . \overleftrightarrow{HK}
- Name the intersection of line c and plane R . K
- Name a point non-coplanar to plane R . N, M



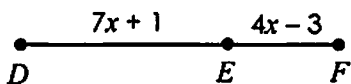
Use the diagram to the right to answer questions 5-8.

- How many planes are shown in the figure? 5
- Give another name for plane W . plane DAC
- Name the intersection of plane ADE and plane W . \overline{AD}
- Name a point non-collinear to points A and B . C



Topic 2: Segment Addition Postulate

9. If $DF = 42$, find DE .



$$7x+1 + 4x-3 = 42$$

$$11x-2 = 42$$

$$11x = 44$$

$$x = 4$$

$$DE: 7(4)+1 = \boxed{29}$$

10. In the diagram below, if $JL = 10x - 2$, $JK = 5x - 8$, and $KL = 7x - 12$, find KL .



$$10x-2 = 5x-8 + 7x-12$$

$$10x-2 = 12x-20$$

$$18 = 2x$$

$$x = 9$$

$$KL: 7(9)-12 = \boxed{51}$$

11. If S is the midpoint of \overline{RT} , $RS = 5x + 17$, and $ST = 8x - 31$, find RS .



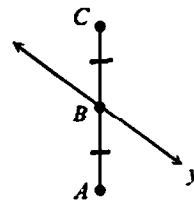
$$5x+17 = 8x-31$$

$$48 = 3x$$

$$x = 16$$

$$RS: 5(16)+17 = \boxed{97}$$

12. If line y bisects \overline{AC} , $AB = 4 - 5x$, and $BC = 2x + 25$, find AC .



$$4-5x = 2x+25$$

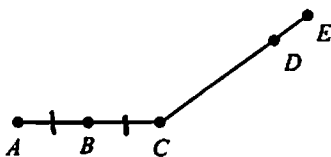
$$4 = 7x+25$$

$$-21 = 7x$$

$$x = -3$$

$$AB: 4-5(-3) = 19 \quad AC: 2(19) = \boxed{38}$$

13. If B is the midpoint of \overline{AC} , $AC = CD$, $AB = 3x + 4$, $AC = 11x - 17$, and $CE = 49$, find DE .



$$2(3x+4) = 11x-17$$

$$6x+8 = 11x-17$$

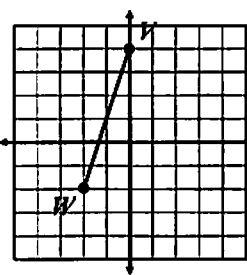
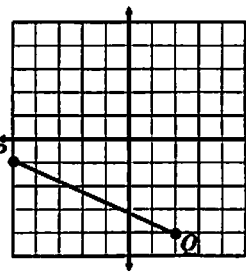
$$25 = 5x$$

$$x = 5$$

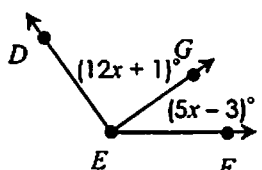
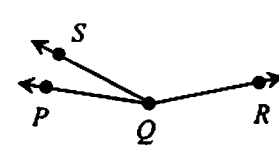
$$AC: 11(5)-17 = 38$$

$$DE = 49-38 = \boxed{11}$$

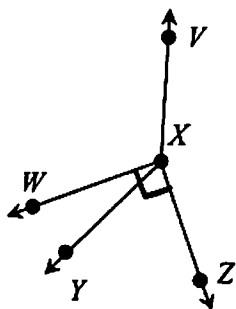
Topic 3: Distance & Midpoint Formula

DISTANCE FORMULA:	MIDPOINT FORMULA:
$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ <p>14. Find ST if $S(-3, 10)$ and $T(-2, 3)$.</p> $ST = \sqrt{(-2 - (-3))^2 + (3 - 10)^2}$ $= \sqrt{1 + 49}$ $= \sqrt{50} \approx \boxed{7.1}$	$MP = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$ <p>15. Find BC if $B(8, -7)$ and $C(-4, -2)$.</p> $BC = \sqrt{(-4 - 8)^2 + (-2 - (-7))^2}$ $= \sqrt{144 + 25}$ $= \sqrt{169} = \boxed{13}$
<p>16. Given the graph below, find WV.</p> <p>$(-2, -2)$ and $(0, 4)$</p>  $WV = \sqrt{(0 - (-2))^2 + (4 - (-2))^2}$ $= \sqrt{4 + 36}$ $= \sqrt{40} \approx \boxed{6.3}$	<p>17. Given the graph below, find PQ.</p> <p>$(-5, -1)$ and $(2, -4)$</p>  $PQ = \sqrt{(2 - (-5))^2 + (-4 - (-1))^2}$ $= \sqrt{49 + 9}$ $= \sqrt{58} \approx \boxed{7.6}$
<p>18. Find the coordinates of the midpoint of \overline{HK} if $H(-1, 2)$ and $K(-7, -4)$.</p> $MP = \left(\frac{-1 + (-7)}{2}, \frac{2 + (-4)}{2} \right)$ $= \left(\frac{-8}{2}, \frac{-2}{2} \right) = \boxed{(-4, -1)}$	<p>19. Find the coordinates of Z if Y is the midpoint of \overline{XZ}, $X(-10, 9)$, and $Y(-4, 8)$.</p> $-4 = \frac{-10 + x}{2} \qquad 8 = \frac{9 + y}{2}$ $-8 = -10 + x \qquad 16 = 9 + y$ $2 = x \qquad 7 = y$ $\boxed{(2, 7)}$

Topic 4: Angle Measures

<p>20. If $m\angle DEF = 117^\circ$, find the value of x.</p> $12x + 1 + 5x - 3 = 117$ $17x - 2 = 117$ $17x = 119$ $\boxed{x = 7}$ 	<p>21. If $m\angle PQS = 16^\circ$, $m\angle SQR = (9x + 17)^\circ$, and $m\angle PQR = (12x - 6)^\circ$, find $m\angle PQR$.</p> $16 + 9x + 17 = 12x - 6$ $9x + 33 = 12x - 6$ $39 = 3x$ $13 = x$ $m\angle PQR: 12(13) - 6 = \boxed{150^\circ}$ 
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22. In the diagram below, $\angle WXZ$ is a right angle. If $m\angle WXV$ is eleven more than three times $m\angle WXY$ and $m\angle YXV = 139^\circ$, find $m\angle YXZ$.



$$m\angle WXV = 3x + 11$$

$$m\angle WXY = x$$

$$3x + 11 + x = 139$$

$$4x = 128$$

$$x = 32$$

$$m\angle WXY = 32$$

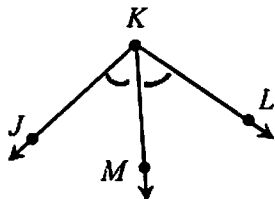
$$m\angle YXZ = 90 - 32 = \boxed{58^\circ}$$

23. If \overline{KM} bisects $\angle JKL$, $m\angle JKL = 92^\circ$, and $m\angle MKL = (5x + 1)^\circ$, find the value of x .

$$5x + 1 = 46$$

$$5x = 45$$

$$\boxed{x = 9}$$



24. If \overline{EF} bisects $\angle AED$, $m\angle AEF = (4x + 3)^\circ$, and $m\angle FED = (7x - 33)^\circ$, find $m\angle CEB$.

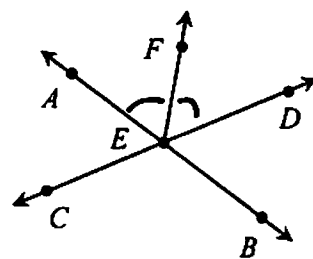
$$4x + 3 = 7x - 33$$

$$36 = 3x$$

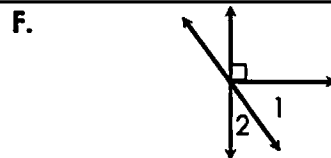
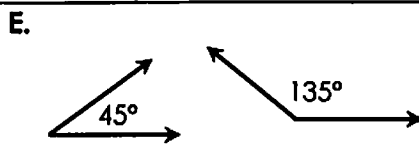
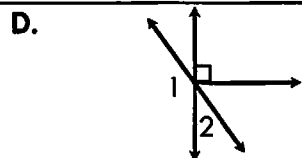
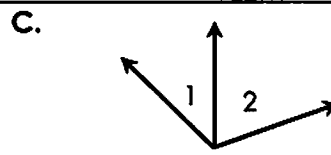
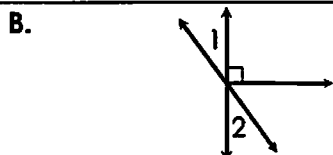
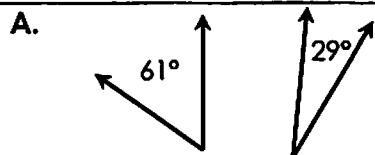
$$x = 12$$

$$m\angle AEF = 4(12) + 3 = 51^\circ$$

$$m\angle CEB = 2(51) = \boxed{102^\circ}$$



Use the diagrams below to answer 25-29.



25. Which diagram(s) show adjacent angles? C, D, F

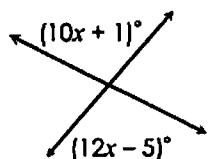
26. Which diagram(s) show vertical angles? B

27. Which diagram(s) show complementary angles? A, F

28. Which diagram(s) show supplementary angles? E, D

29. Which diagram(s) show a linear pair? D

30. Solve for x .

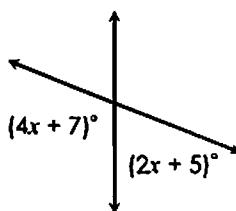


$$10x + 1 = 12x - 5$$

$$6 = 2x$$

$$\boxed{x = 3}$$

31. Solve for x .



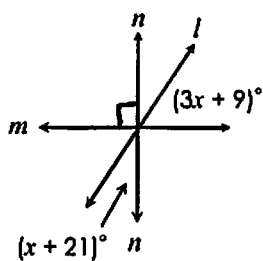
$$4x + 7 + 2x + 5 = 180$$

$$6x + 12 = 180$$

$$6x = 168$$

$$\boxed{x = 28}$$

32. If $m \perp n$, solve for x .



$$\begin{aligned} x + 21 + 3x + 9 &= 90 \\ 4x + 30 &= 90 \\ 4x &= 60 \\ \boxed{x = 15} \end{aligned}$$

33. $\angle 1$ and $\angle 2$ form a linear pair. If $m\angle 1 = (18x - 1)^\circ$ and $m\angle 2 = (23x + 17)^\circ$, find $m\angle 2$.

$$\begin{aligned} 18x - 1 + 23x + 17 &= 180 \\ 41x + 16 &= 180 \\ 41x &= 164 \\ x &= 4 \end{aligned}$$

$$m\angle 2: 23(4) + 17 = \boxed{109^\circ}$$

34. $\angle G$ and $\angle H$ are complementary angles. If $m\angle G = (6x - 15)^\circ$ and $m\angle H = (3x + 6)^\circ$, find $m\angle H$.

$$\begin{aligned} 6x - 15 + 3x + 6 &= 90 \\ 9x - 9 &= 90 \\ 9x &= 99 \\ x &= 11 \end{aligned}$$

$$\begin{aligned} m\angle H: 3(11) + 6 \\ = \boxed{39^\circ} \end{aligned}$$

35. $\angle 1$ and $\angle 2$ are vertical angles. If $m\angle 1 = (5x + 12)^\circ$ and $m\angle 2 = (6x - 11)^\circ$, find $m\angle 1$.

$$\begin{aligned} 5x + 12 &= 6x - 11 \\ 23 &= x \end{aligned}$$

$$m\angle 1: 5(23) + 12 = \boxed{127^\circ}$$

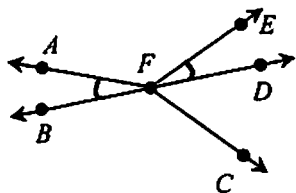
36. The measure of $\angle P$ is five less than four times the measure of $\angle Q$. If $\angle P$ and $\angle Q$ are supplementary angles, find $m\angle P$.

$$\begin{aligned} m\angle Q &= x \\ m\angle P &= 4x - 5 \end{aligned}$$

$$\begin{aligned} x + 4x - 5 &= 180 \\ 5x &= 185 \\ x &= 37 \end{aligned}$$

$$\begin{aligned} m\angle P &= 4(37) - 5 \\ &= \boxed{143^\circ} \end{aligned}$$

37. In the diagram below, $\angle AFB \cong \angle EFD$. If $m\angle EFD = (5x + 6)^\circ$, $m\angle DFC = (19x - 15)^\circ$, and $m\angle EFC = (17x + 19)^\circ$, find $m\angle AFE$.

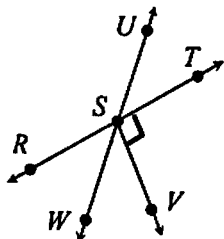


$$\begin{aligned} 5x + 6 + 19x - 15 &= 17x + 19 \\ 24x - 9 &= 17x + 19 \\ 7x &= 28 \\ x &= 4 \end{aligned}$$

$$m\angle EFD = 5(4) + 6 = 26^\circ$$

$$m\angle AFE = 180 - 2(26) = \boxed{128^\circ}$$

38. If $\overline{SV} \perp \overline{RT}$, $m\angle RSU = (17x - 3)^\circ$, and $m\angle UST = (6x - 1)^\circ$, find each missing measure.



$$\begin{aligned} 17x - 3 + 6x - 1 &= 180 \\ 23x &= 184 \\ x &= 8 \end{aligned}$$

$$m\angle RSU: 17(8) - 3 = 133$$

$$m\angle UST: 6(8) - 1 = 47$$

$$x = \underline{8}$$

$$m\angle RSU = \underline{133^\circ}$$

$$m\angle UST = \underline{47^\circ}$$

$$m\angle WSV = \underline{43^\circ}$$

$$m\angle VSU = \underline{137^\circ}$$