geoH – ch.1 review solns

1. ① – It should be a 2x2 cube with two boxes coming off the left and two boxes across the front of the right

2. plane ACE (contains D too) and plane BCD (contains F too) intersect at line $\overleftrightarrow{CD}$ (B)

3. 2 points define a line, 3 non-colinear points define a plane... so (B)

4. $\overleftrightarrow{ED}$ contains points E, D, and M... so any line name with two of those three points. From the choices, that's $\overleftrightarrow{DM}$ (B)

5. similar to question #2... they intersect in a line (B)

6. ∠4 has vertex at V and includes S and W... so either ∠SVW or ∠WVS... thus ans ⓒ ∠SVW

7. m∠LJB = m∠IJM and m∠LJB + m∠IJM = 90°, thus they are each 45°, which is ACUTE
   (A)

(8) supplementary means sums to 180°

$$(3x+10) + (6x+8) = 180$$
$$9x + 18 = 180$$
$$9x = 162$$
$$x = 18 \leftarrow \text{not the ANS...}$$

IT'S A trap, DON'T PICK A !!!

FIND $m\angle FDE = 6x + 8$
$$= 6(18) + 8 = \boxed{116°} \quad \textcircled{D}$$

(9) supplementary means sums to 180°
(So all linear pairs are always supplementary)
possible answers
$\angle 1$ and $\angle 3$ Ⓐ
$\angle 1$ and $\angle 5$ (not a choice)

(10) vertical angles are created by intersecting lines... they are the "opposite" angles, sort of like an hourglass
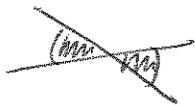
~~⧖~~ or ~~⧓~~

the only candidates in the diagram are $\angle 2$ and $\angle 5$ Ⓒ

(11) Ⓑ Draw the ray longer than $\overline{AB}$ so that you can use a compass to measure AB and then shorten your ray to match.

⑫ Ⓕ In constructions, you can't use A ruler to measure length, you use a compass for that reason Ⓕ

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⑬ it's eAsier to show why the three wrong answers are false

F. <u>NO</u> - only the segment is cut in hALF, the perpendicular bisector does <u>not</u> have to be cut in hALF

G. NO - <u>perpendicular</u> means intersects at 90°

H. NO - perpendicular means intersects at 90°

Ⓘ ← yes!! that is whAt perpendicular means!!

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⑭ to find the midpoint we average the x's (to get x) and average the y's (to get y)

midpoint or (x_1, y_1) and (x_2, y_2)

is $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ thus

$(2, -2)$ and $(4, 2)$ gives us Ⓕ

midpoint: $\left(\frac{2+4}{2}, \frac{-2+2}{2}\right) = (3, 0)$

(15)

X ———|———•———|——— Z
      Y
        ↑
    midpoint
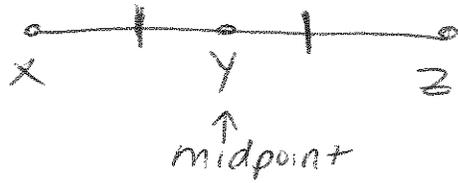
SO $\overline{XY} \cong \overline{YZ}$ and $\overline{XZ}$ is Double the length of $\overline{XY}$ or $\overline{YZ}$

thus $\overline{XZ} = 2(\overline{XY}) = 2(\overline{YZ})$

$\overline{XZ} = 2(\overline{YZ})$

$\boxed{\frac{1}{2}(\overline{XZ}) = \overline{YZ}}$ ← IT'S (I)

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(17)

oops!
16 is
on
next page
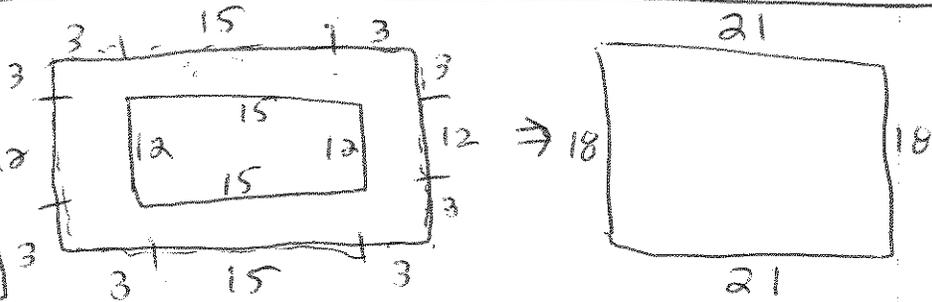
$P = 18 + 21 + 18 + 21 = \boxed{78 FT}$ ← linear units b/c perimeter is length

(A) P

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(18)

12

R — 9 — Q

(D)
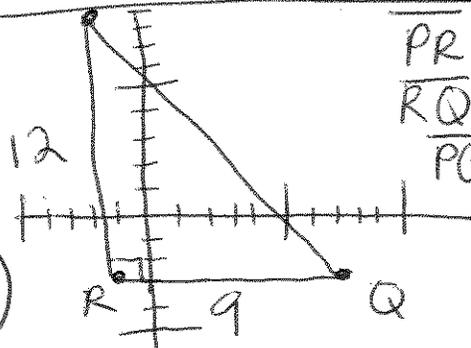
$\overline{PR} = 12$
$\overline{RQ} = 9$
$\overline{PQ} = 15$ ← either by pythagorean thm

$9^2 + 12^2 = (PQ)^2$
$81 + 144 = (PQ)^2$
$225 = (PQ)^2$
$15 = PQ$

OR
3-4-5 pythag. triple
(9-12-15)
L-L-H

Perimeter =
$9 + 12 + 15 = \boxed{36}$

geo H - ch. 1 review solns

(16) *out of order, sorry*

$C(-2, -10)$ $D(x_1, y_1)$

midpoint of $\overline{CD}$ is $m(-3, -7)$

so

$$\frac{-2+x_1}{2} = -3$$

$$-2+x_1 = -6$$

$$x_1 = -4$$

$$\frac{-10+y_1}{2} = -7$$

$$-10+y_1 = -14$$

$$y_1 = -4$$

(A) $D(-4, -4)$

OR DRAW IT

$D(-4, -4) \rightarrow$
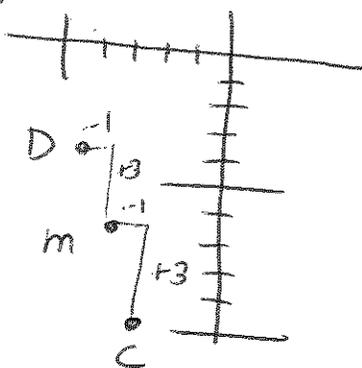
(19) $d = 5$ IN so $r = \frac{5}{2}$ IN $= 2.5$ IN

$A = \pi r^2 = \pi (2.5)^2 = \boxed{6.25\pi \text{ IN}^2}$

(C)

(15 (20) easier to show which can be false by giving counter examples

F. FALSE - parallel lines on same plane
↙↗ never intersect

G. FALSE - perpendicular lines on same plane intersect @ 90° angle

⤡

(H) TRUE - if the lines are on the same plane (like a piece of paper) all points on the lines have to be on that same paper

I. false (see example for F.)

_____

(H)

(21) (multiple correct answers... you just need one of them)

← easiest option

㉒

```
    G   H   I   J   K   L   M   N   O
←———|———|———|———|———|———|———|———|———|———→
   -7  -6  -5  -4  -3  -2  -1   0   1        (Y,)
           ‿‿‿‿‿‿   ‿‿‿‿‿‿
           2 UNITS   2 UNITS
```
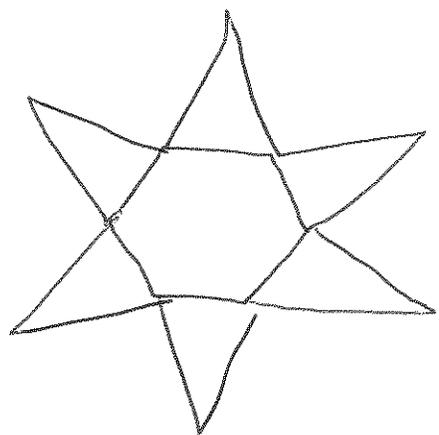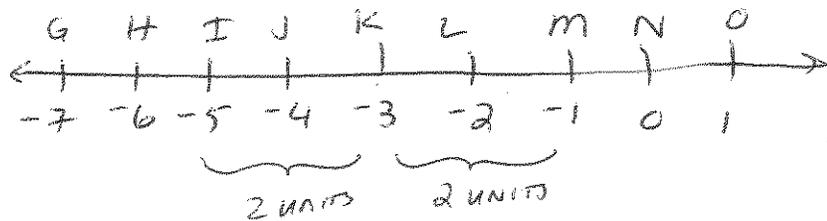
ANS: I and M

㉓ $\overline{GJ}$ is $|-4-(-7)| = |-4+7| = 3$

3 units long... so pick any other 3 unit segment

possible ANS: $\overline{HK}$, $\overline{IL}$, ~~$\overline{IM}$~~, $\overline{JM}$, $\overline{KN}$ and $\overline{LO}$

㉔

So either ∠LSM and ∠OSN
(or other names for them)

OR ∠LSO and ∠MSN
(or other names for them)

㉕

or

So possible answers:
∠MSL an ∠MSN
or ∠LSM and ∠LSO
or ∠LSO and ∠OSN
or ∠NSO and ∠NSM

(26)

$$2x-13 \quad I$$
$$x-3$$
$$G \qquad D$$
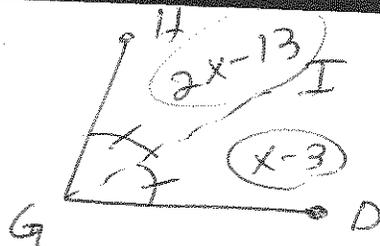
If $\angle DGH$ is bisected (cut in half)
then
$$m\angle DGI = m\angle IGH$$
$$x-3 = 2x-13$$
$$-x = -10$$
$$\boxed{x = 10}$$

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(27) Supplementary means sums to
180°. $m\angle 1 + m\angle 2 = 180°$
$$4y+7 + 9y+4 = 180°$$
$$13y + 11 = 180°$$
$$13y = 169$$
$$y = 13 \leftarrow \underline{not} \text{ the ANS}$$
$$m\angle 2 = 9y+4 = 9(13)+4 = 117+4$$
$$\boxed{m\angle 2 = 121°}$$

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(28)

13 IN
10 IN
10 IN
13 IN
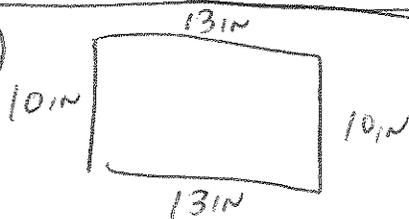
$$P = 10+13+10+13$$
$$\boxed{= 46 \text{ IN}}$$

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(29) $d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2} = \sqrt{(0-3)^2 + (3-(-1))^2}$
$$= \sqrt{3^2+4^2} = \sqrt{25}$$
$$= 5$$

$$d = 5$$
$$r = \frac{5}{2} = 2.5 \qquad A = \pi r^2 = \pi(2.5)^2$$
$$\boxed{= 6.25\pi = \frac{25}{4}\pi}$$

(30) mid $(4,5)$ $S(-2,7)$ $m(x_1, y_1)$

So

$$\frac{-2+x_1}{2} = 4$$

$$-2+x_1 = 8$$

$$x_1 = 10$$

$$\frac{7+y_1}{2} = 5$$

$$7+y_1 = 10$$

$$y_1 = 3$$

$$\boxed{m\ (10,3)}$$

or   Do it by graphing: