GPE-B5a

# Practice Assessment

Solutions (VM)

1. Do the following linear equations graph lines that are parallel, perpendicular, or neither? Use numbers to justify your answer.

$$\begin{cases} 3x + 2y = 4 \\ 4x - 6y = -18 \end{cases}$$

$y = mx + b$ (slope when $y$ is isolated)

same slope

opposite reciprocal slopes — or — slopes' product is $-1$.

$3x + 2y = 4$

$-3x \quad -3x$

$\frac{2y}{2} = \frac{-3x + 4}{2}$

$y = -\frac{3}{2}x + 2$

$4x - 6y = -18$

$-4x \quad -4x$

$\frac{-6y}{-6} = \frac{-4x - 18}{-6}$

$y = \frac{4}{6}x + 3 \rightarrow$ simplify $y = \frac{2}{3}x + 3$

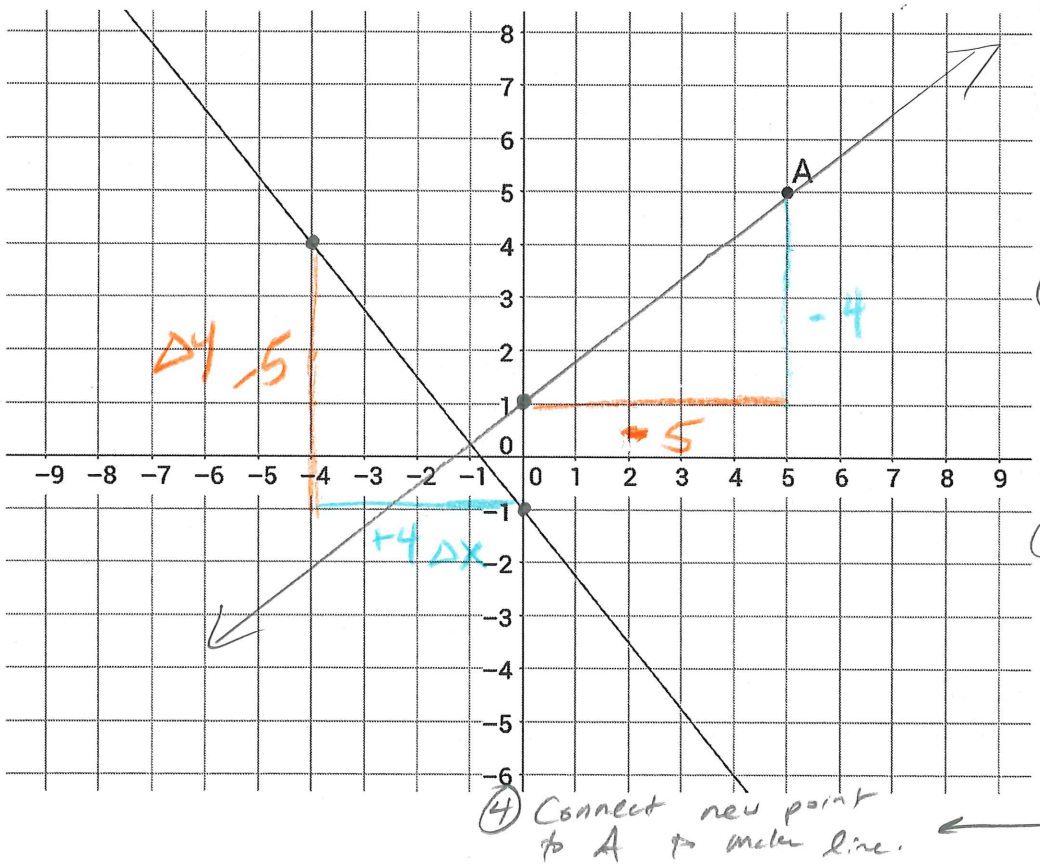
Perp.

$-\frac{3}{2} \perp \frac{2}{3}$

— or —

$-\frac{3}{2} \cdot \frac{2}{3} = \frac{-6}{6} = -1$

2. Graph a line that is perpendicular to the given line, that passes through the given point.




(1) Find points on grid on line.

$m = \frac{-5}{4} = \frac{\Delta y}{\Delta x}$

(2) Make slope perpendicular (opp. reciprocal)

$m_{\perp} = \frac{4}{5}$

(3) Go to point and "apply" slope.

→ Note, not enough room to go up 4, right 5...

So go DOWN 4, BACK 5

(4) Connect new point to A to make line.

3. Which of the following linear equations graphs a line that passes through point $(1, -3)$ and is parallel to $y = -2x + 6$? Select all that apply.

[X] $y = -2x - 1$ [X] $y + 3 = -2(x - 1)$ [ ] $y = \frac{1}{2}x - \frac{7}{2}$ [ ] $y = -2x - 3$

Same slope $m = -2$

POINT SLOPE FORM:

$y - y_1 = m(x - x_1) \Rightarrow y + 3 = -2(x - 1)$

solve for $y$.

$y + 3 = -2x + 2$

$y = -2x - 1$

SEE p. 3 FOR ALTERNATE APPROACH.

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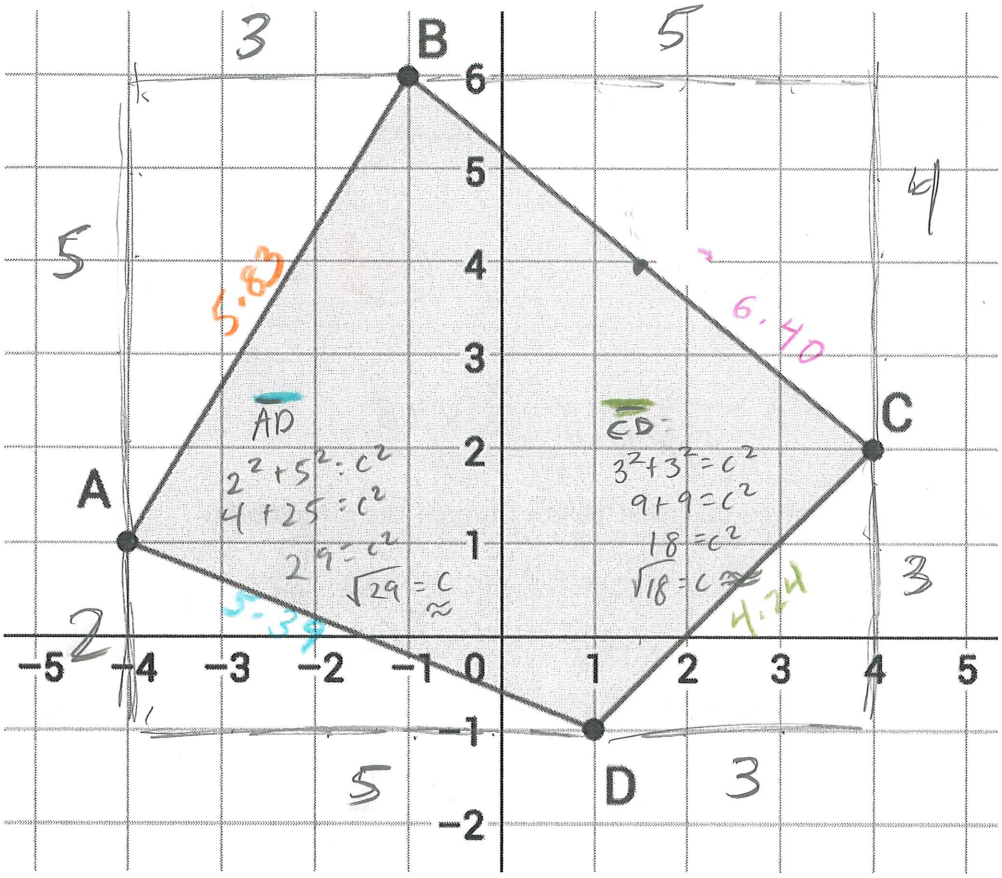
4. Find the perimeter, to the nearest hundredth, of the quadrilateral ABCD. Show all work.

Perimeter: 21.86




$\overline{AB}$: $5^2+3^2=c^2$, $25+9=c^2$, $34=c^2$, $\sqrt{34}=c\approx 5.83$

$\overline{BC}$: $5^2+4^2=c^2$, $25+16=c^2$, $41=c^2$, $\sqrt{41}=c\approx 6.40$

$\overline{AD}$: $2^2+5^2=c^2$, $4+25=c^2$, $29=c^2$, $\sqrt{29}=c\approx 5.39$

$\overline{CD}$: $3^2+3^2=c^2$, $9+9=c^2$, $18=c^2$, $\sqrt{18}=c\approx 4.24$

5. Using the figure above, find the coordinates of the midpoint of $\overline{BC}$.

B: (−1, 6) C: (4, 2)

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

$\left(\frac{-1+4}{2}, \frac{6+2}{2}\right)$

$\left(\frac{3}{2}, \frac{8}{2}\right)$

(1.5, 4)

6. (no figure provided) Suppose point S has coordinates $(\underset{x_1}{-12}, \underset{y_1}{29})$ and point R has coordinates $(\underset{x_2}{-14}, \underset{y_2}{20})$. Find the exact distance between points S and R. Show all work.

$d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}=$

$d=\sqrt{(-12--14)^2+(29-20)^2}$

$d=\sqrt{(2)^2+(9)^2} \rightarrow \sqrt{4+81}=\sqrt{85}$

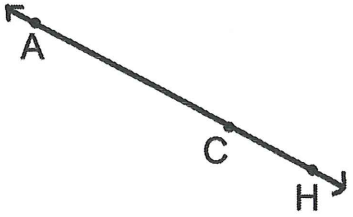
CO-A1a

7. Give the precise definition of the term "line segment" in terms of points, lines, and planes. Then draw and label a line segment. Finally, give all possible names for the line segment you drew using correct notation. Part of a line bounded by 2 endpoints, including the endpoints.

ex


$\overline{AG}$ and $\overline{GA}$

8. Give all possible names, using correct notation, for the line shown here:




$\overleftrightarrow{AC}$ $\overleftrightarrow{CA}$ $\overleftrightarrow{HA}$ $\overleftrightarrow{AH}$

$\overleftrightarrow{CH}$ $\overleftrightarrow{HC}$

No others!

Alt.

3. Which of the following linear equations graphs a line that passes through point $(1, -3)$ and is parallel to $y = -2x + 6$? Select all that apply.

[ ] $y = -2x - 1$ [ ] $y + 3 = -2(x - 1)$ [ ] $y = \frac{1}{2}x - \frac{7}{2}$ [ ] $y = -2x - 3$

Nope! Slope is $\neq -2$.

Same slopes; given line has slope $-2$.

Technique: Plug $(1, -3)$ in for $x$ and $y$ to see if resulting equation is true or false.

[✓] $y = -2x - 1$

$-3 = -2(1) - 1$

$-3 = -2 - 1$

$-3 = -3$

true? yes!

[✓] $y + 3 = -2(x - 1)$

$-3 + 3 = -2(1 - 1)$

$0 = -2(0)$

$0 = 0$

true? yes!

[ ] $y = -2x - 3$

$-3 = -2(1) - 3$

$-3 = -2 - 3$

$-3 = -5$

true? No!

$-3 \neq -5$