Warm-up Activity

previous assignment:
Page 25, 26 14 - 30 evens
Page 27, 59 - 68 all

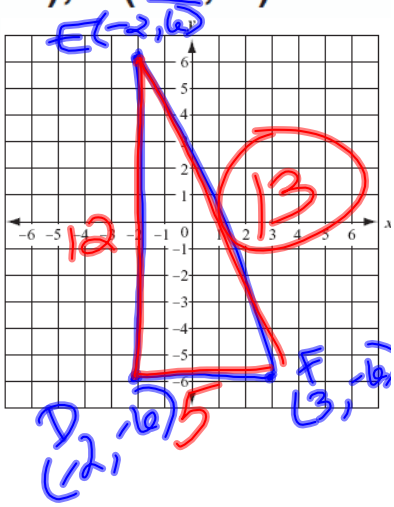
Standardized Test Practice What is the perimeter of triangle *DEF* if its vertices are *D*(−2, −6), *E*(−2, 6) and *F*(3, −6)?

A 12 units

B 13 units

C 17 units

D 30 units



$d = \sqrt{(3+2)^2+(6+6)^2}$

$\sqrt{5^2+12^2}$

$\sqrt{25+144}$

$\sqrt{169}$

13

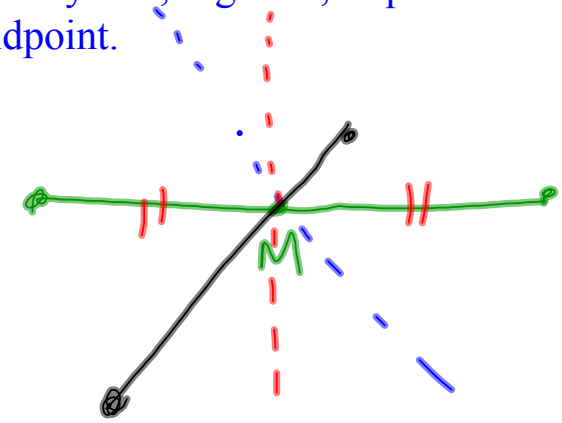
1-3B Midpoint of Line Segments

previous assignment:
Page 25, 26 14 - 30 evens
Page 27, 59 - 68 all

- *finding midpoint on the number line.*
- *finding midpoint on the coordinate plane.*
- *finding other endpoint given midpoint and endpoint.*

midpoint: the midpoint M of PQ is the point between P and Q such that PM = MQ.

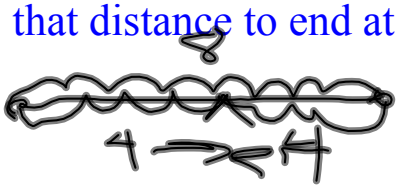
segment bisector: any line, segment, or plane that intersects a segment at it's midpoint.



midpoint on the number line

- find the distance, then move 1/2 that distance to end at midpoint.

OR



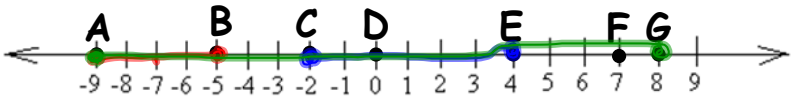
- find the average of the two points: $\frac{A + B}{2}$

midpoint on the coordinate plane

- find the average of each coordinate.

Midpoint Formula: **M** = $\left(\frac{x + x}{2}, \frac{y + y}{2}\right)$

Examples: ***find the midpoint of the following segments using the number line below.***



1. AB = -7 $\frac{-9+(-5)}{2} = \frac{-14}{2} = -7$
2. EC = 1 $\frac{-2+4}{2} = \frac{2}{2} = 1$
3. AG = $-1/2$ $\frac{-9+8}{2} = \frac{-1}{2}$ / $\frac{8+(-9)}{2} = \frac{-1}{2}$

Examples: ***find the midpoint of the following segments using the midpoint formula.***

4. A(8. -6) and B(-14, 12)

$M = \left(\frac{x+x}{2}, \frac{y+y}{2}\right)$ → $M\left(\frac{8+(-14)}{2}, \frac{-6+12}{2}\right)$

$M\left(\frac{-6}{2}, \frac{6}{2}\right)$

$M(-3, 3)$

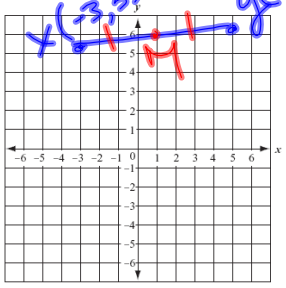
5. X(-3, 5) and Y(5, 6)

$M = \left(\frac{x+x}{2}, \frac{y+y}{2}\right)$

$M = \left(\frac{-3+5}{2}, \frac{5+6}{2}\right)$

$M = \left(\frac{2}{2}, \frac{11}{2}\right)$

$M = (1, 5.5)$



6. find the coordinates of ***endpoint D*** if E(-6, 4) is the midpoint of DF and F has coordinates (-5, -3).

D(x,y)

E(-6,4)

F(-5,-3)

$M = \left(\frac{x+x}{2}, \frac{y+y}{2}\right)$

$(-6, 4) = \left(\frac{-5+x}{2}, \frac{-3+y}{2}\right)$

$2 \cdot -6 = \frac{(-5+x) \cdot 2}{2}$

$-12 = -5 + x$

$+5 \quad +5$

$-7 = x$

$2 \cdot 4 = \frac{(-3+y) \cdot 2}{2}$

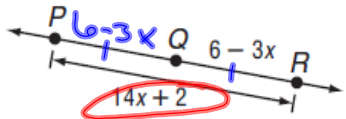
$8 = -3 + y$

$+3 \quad +3$

$11 = y$

$D(-7, 11)$

7. What is the measure of PR if Q is the midpoint of PR?



$6-3x+6-3x=14x+2$

$12-6x=14x+2$

$-2+6x \quad +6x \quad -2$

$\frac{10}{20}=\frac{20x}{20}$ $\quad x=\frac{1}{2}$

$2(6-3x)=14x+2$

$12-6x=14x+2$

$-2+6x \quad +6x \quad -2$

$10=20x$

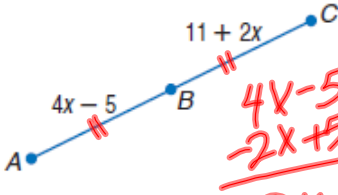
$\frac{1}{2}=x$

$PR=14(\frac{1}{2})+2$

$=7+2$

$PR=9$

8. What is the measure of BC if B is the midpoint of AC?



$4x-5=11+2x$

$-2x+5 \quad +5 \quad -2x$

$\frac{2x}{2}=\frac{16}{2}$

$x=8$

$BC=11+2(8)$

$=11+16$

$BC=27$

31 - 44 all