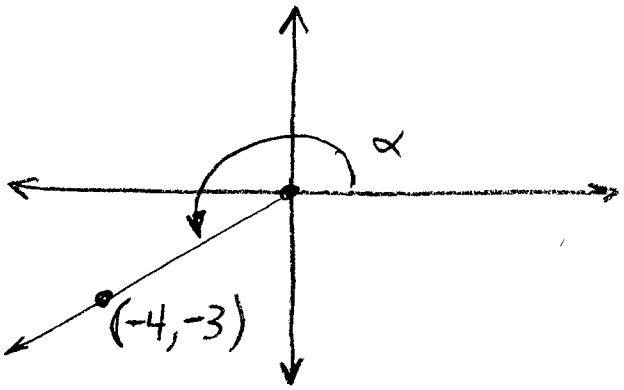
BE-PRECALC TUESDAY 10-27-09

ACT
Borrows

① FOR THE ANGLE α SHOWN BELOW, WHICH STATEMENT IS TRUE?

Ⓐ $\sin\alpha = \frac{-3}{5}$ Ⓑ $\cos\alpha = \frac{4}{5}$ Ⓒ $\tan\alpha = \frac{-3}{4}$ Ⓓ $\cot\alpha = \frac{-4}{3}$ Ⓔ $\sec\alpha = \frac{-5}{3}$



LET REF. $\angle = \theta$, NOTE: QUADRANT III $\Rightarrow$ TAN = (+)
$\Rightarrow$ NOT Ⓒ or Ⓓ

Ⓐ $\sin\theta \Rightarrow$ $y = -3$, $-4 = x$, $\sqrt{9+16} = 5$ $= \boxed{\frac{-3}{5}\ \checkmark A}$

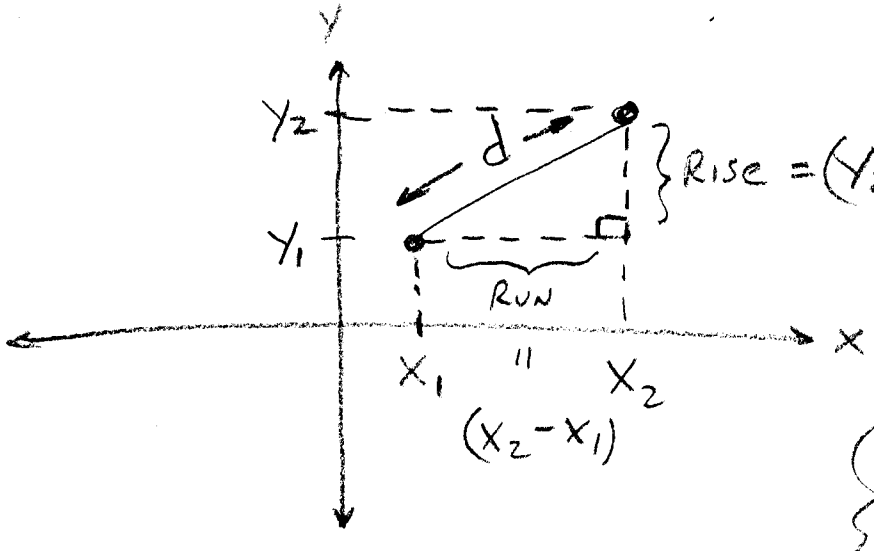
OR Ⓑ ☹ DIDN'T NEED TO CHECK

Ⓑ $\cos\theta = \frac{-4}{5} \Rightarrow$ NOT Ⓑ

Ⓔ $\sec\theta = \frac{1}{\cos\theta} \Rightarrow \frac{-5}{4}$ NOT Ⓔ

Ch. 10-1 Intro. to Analytic Geometry

↳ the distance & midpoint formulas



$$m = \frac{\text{rise}}{\text{run}}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$d^2 = \text{rise}^2 + \text{run}^2$$

$$d^2 = (y_2 - y_1)^2 + (x_2 - x_1)^2$$

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

OR

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

THE DISTANCE FORMULA

d = distance between any 2 points $(x_1, y_1), (x_2, y_2)$ on the x-y coordinate plane.

(EX) Find distance between $(-4, 1), (5, 9)$

PG615

$d^2 = \text{RISE}^2 + \text{RUN}^2$ $(-4, 1), (5, 9)$

$d^2 = (9-1)^2 + (5-(-4))^2$

$d^2 = 8^2 + 9^2 = 64 + 81 = 145$

$d = \sqrt{145} = 145 = 5 \cdot 29$ $= \boxed{\sqrt{145} \text{ units}}$ EXACT

$\cong \boxed{12.04 \text{ units}}$ APPROXIMATE (NEAREST hundredth)

EX PG616 Distance between $(2.0, 2.8), (-1.5, 4.0)$

$(2.0, 2.8), (-1.5, 4.0)$

$d = \sqrt{(4-2.8)^2 + (-1.5-2.0)^2} = \sqrt{(1.2)^2 + (-3.5)^2}$

$d = \sqrt{1.44 + 12.25} = \sqrt{13.69} \cong \boxed{3.7 \text{ units}}$

Per map $\Rightarrow$ $3.7 \text{ units} \cdot \frac{15 \text{ km}}{\text{UNITS}} = \underline{55.5 \text{ km}}$

What is the average of 20 and 30

$\frac{20+30}{2} = 25$

Note: The average of 2 numbers is exactly in the middle of the two numbers

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Find the (x, y) coordinates of the midpoint between $(-2, 4), (6, -5)$

Midpoint Formula $\Rightarrow$ Midpoint of $(x_1, y_1), (x_2, y_2) = \left(\frac{x_1+x_2}{2}, \frac{x+y_2}{2}\right)$

↑ Avg. or middle of x's

↑ Avg. or middle of y's

$\therefore$ Midpoint $(x, y) \Rightarrow \left(\frac{6+(-2)}{2}, \frac{4+(-5)}{2}\right)$

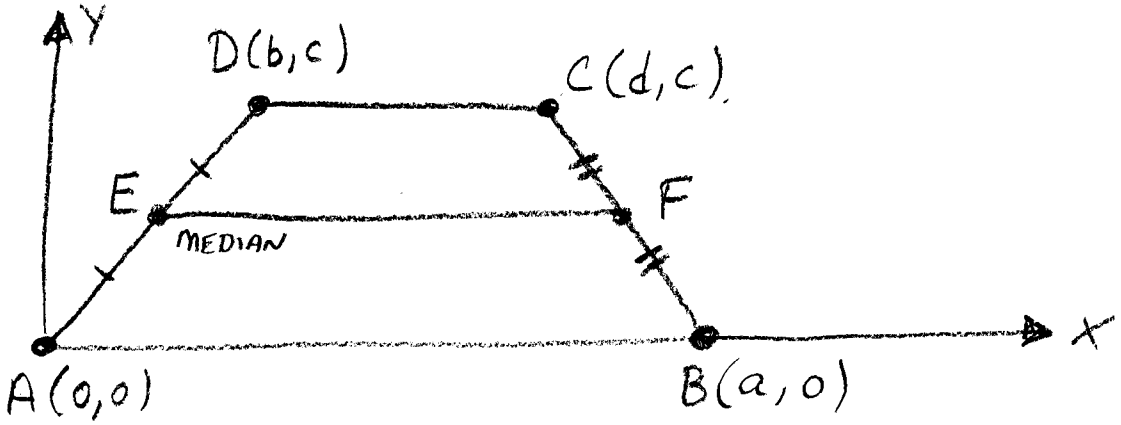
$= \left(\frac{4}{2}, \frac{-1}{2}\right)$

$= \boxed{\left(2, -\frac{1}{2}\right)}$ Check with graph?

Ex 4 Pg 618 ↑

Ex 5 Pg 618

PROVE the median of a trapezoid is $\frac{1}{2}$ the sum of the two bases



E = MIDPOINT $\overline{AD} = \left(\frac{b+0}{2}, \frac{c+0}{2}\right) = \left(\frac{b}{2}, \frac{c}{2}\right)$

F = MIDPOINT $\overline{CB} = \left(\frac{d+a}{2}, \frac{c}{2}\right)$

↳ NOTE: SAME Y ⇒ HORIZONTAL LINE

$\overline{EF}^2 \Rightarrow \left(\frac{b}{2}, \frac{c}{2}\right), \left(\frac{d+a}{2}, \frac{c}{2}\right) \Rightarrow 0^2 + \left[\frac{d+a-b}{2}\right]^2$

$\sqrt{EF^2} = \overline{EF} = \boxed{\frac{d+a-b}{2} = \text{MEDIAN}}$ ⇒ IS THIS THE SUM OF BASES?

BASE 1 $= \overline{AB} \Rightarrow \overline{AB}^2 = 0 + a^2 \therefore \boxed{\overline{AB} = a}$

BASE 2 $= \overline{DC} \Rightarrow \overline{DC}^2 = (b,c),(d,c) = 0^2 + (d-b)^2$

$\therefore \boxed{\overline{DC} = d-b}$

CK $\quad \frac{d+a-b}{2} \stackrel{?}{=} \frac{1}{2}\left[a+d-b\right]$ ✓

NOTE: $\boxed{A_{\square} = \frac{1}{2}(b_1+b_2)h} = (\text{MEDIAN})(\text{HEIGHT})$

Homework: Pg 620

12 – 17, 21

#21 Hint

$$d^2 \Rightarrow (a, -9), (-2a, 7) = 20^2$$

RISE

RUN