

ACT
PRACTICE

①
$$\begin{cases} -2x + 3y = 30 \\ 4x - \frac{1}{4}y = -14 \end{cases}$$
 FIND X.

②
$$\left(\frac{1}{2} \times \frac{3}{5}\right) + \frac{5}{6} - \left(\frac{1}{3} \div \frac{5}{8}\right)$$

- ③ Apartment complex. 30 apartments, each rent for \$320 per month. If 70% are rented for 6 months, how much rent will be charged in total for the 6 months?
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$$\textcircled{1} \quad \begin{array}{l} -2x + 3y = 30 \xrightarrow{(8)} -16x + 24y = 240 \\ 4x - \frac{1}{4}y = -14 \xrightarrow{(4)} 16x - y = -56 \end{array}$$

$$23y = 184$$

$$y = 8$$

$$\therefore -2x + 24 = 30$$

$$-2x = 6$$

$$\boxed{x = -3}$$

$$\textcircled{2} \quad \left(\frac{1}{2} \cdot \frac{3}{5} \right) + \frac{5}{6} - \left(\frac{1}{3} \div \frac{5}{8} \right)$$

$$\frac{3}{10} + \frac{5}{6} - \frac{8}{15}$$

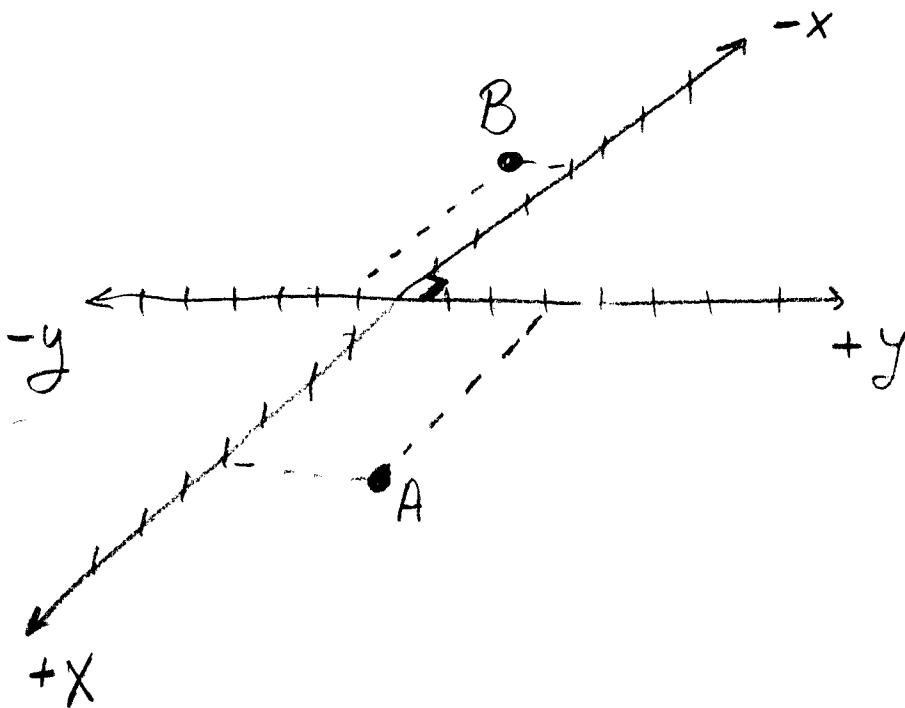
$$\frac{18}{60} + \frac{50}{60} - \frac{32}{60} = \frac{36}{60} = \boxed{\frac{3}{5}}$$

$$\textcircled{3} \quad 30 \text{ APARTMENT} \cdot (.7) = 21 \text{ rented}$$

$$\begin{array}{r} 320 \\ \times 21 \\ \hline 320 \\ 640 \\ \hline 6720 \text{ per month} \end{array}$$

$$\begin{array}{r} 6720 \\ \times 6 \\ \hline \boxed{40320 \text{ dollars total}} \\ \text{@ 6 mo.} \end{array}$$

For reasons you will see in a minute, let's change our (X, Y) coordinate plane and find a few points (ordered pairs)



$$A(4, 3)$$

x, y

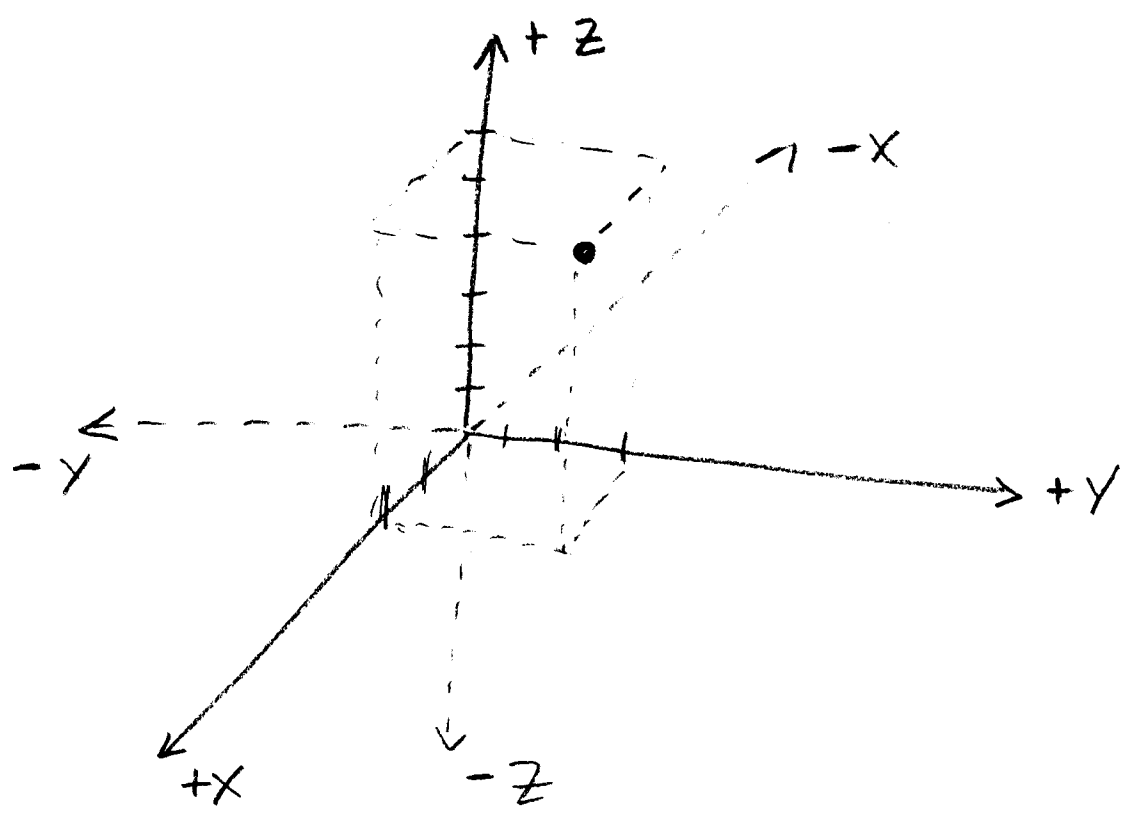
$$B(-4, -1)$$

$$C(-6, 2) = ?$$

$$D(1, -4) = ?$$

ordered triple (x, y, z)
 A point in space

EX $(2, 3, 6)$



OCTANTS

I	+	+	+
II	-	+	+
III	-	-	+
IV	+	-	+
<hr/>			
V	+	+	-
VI	-	+	-
VII	-	-	-
VIII	+	-	-



Ch 13-5 Coordinates in Space

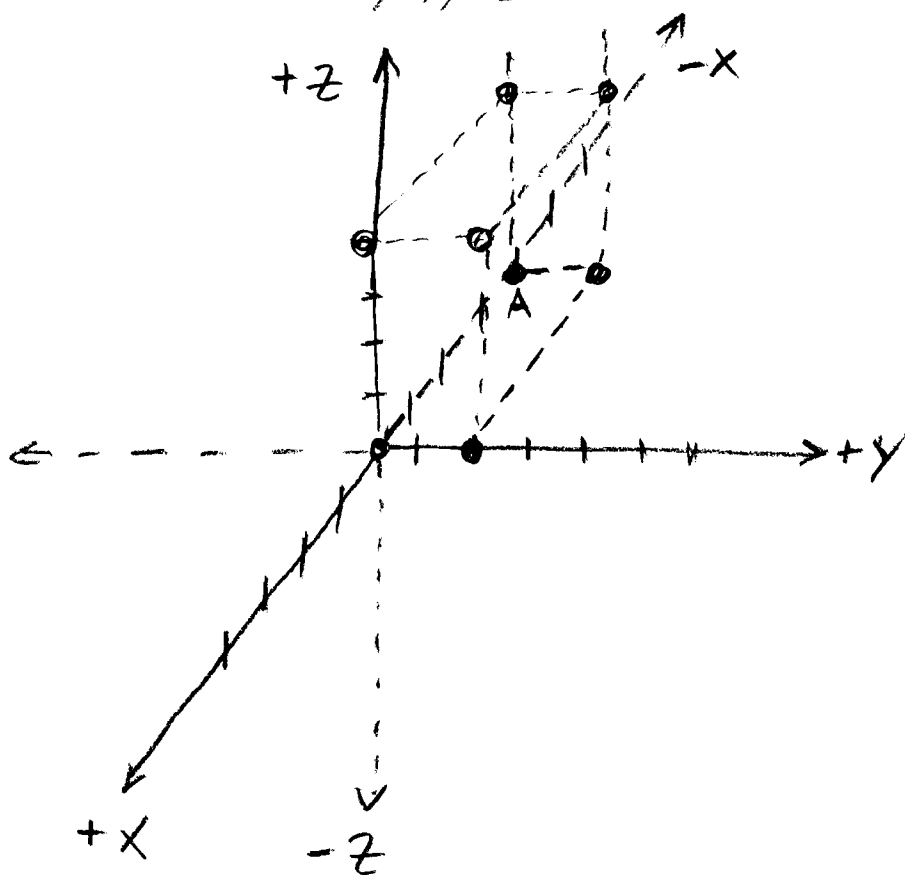
Ex 1
Pg
714

GRAPH THE RECTANGULAR PRISM

that has vertices AT

$A(-4, 2, 4)$ and the origin $(0, 0, 0)$

x, y, z



DISTANCE FORMULA

$$A(x_1, y_1, z_1), B(x_2, y_2, z_2)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

Midpoint Formula

$$\text{Midpoint} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}, \frac{z_1 + z_2}{2} \right)$$

Equation of Sphere WITH CENTER
AT ORIGIN

$$x^2 + y^2 + z^2 = r^2$$

General, CENTER AT ANY POINT $C(x_1, y_1, z_1)$

$$(x - x_1)^2 + (y - y_1)^2 + (z - z_1)^2 = r^2$$

EX2
P5715

Find distance & midpoint
between $T(6, 0, 0)$ and $Q(-2, 4, 2)$

$$d = \sqrt{(-2-6)^2 + (4-0)^2 + (2-0)^2}$$

$$d = \sqrt{64 + 16 + 4} = \sqrt{84}$$

$$d = \sqrt{4 \cdot 21} = \boxed{2\sqrt{21} \text{ units}}$$

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

$$\boxed{M = (2, 2, 1)}$$

x, y, z

Homework: Pg 717 # 2, 4, 5, 6, 7