

Exam 1

- i. Rotated square $(-3, -8)$ and $(2, 6)$

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

$$(2+3)^2 + (6+8)^2$$

- ii. x & y vary together $y = 4x + 10$

a. x varies from $x = 9.5$ to $x = 2$

$$-7.5$$

- iii. how much does y change by?

$$\Delta y = -38$$

$$4(9.5) + 10 \rightarrow 38 + 10 = 48$$

$$4(2) + 10 \rightarrow 8 + 10 = 18$$

- iv. change in y is how many times as large as the change in x ?

$$-38 / -7.5$$

- b. x varies from $x = -6$ to $x = -5.8$

- i. how much does x change by?

$$-6 + (-5.8) = 0.2$$

- ii. how much does y change by?

$$0.8$$

$$y = 4(-6) + 10 \rightarrow -24 + 10 = -14$$

$$y = 4(-5.8) + 10 \rightarrow -23.2 + 10 = -$$

- iii. The change in y is how many times as large as the change in x ?

$$0.8 / 0.2 = 4$$

Question 3

express x in terms of y or express y in terms of x

$$x^2 + y^2 = 1 \rightarrow \text{neither}$$

$$y = 5 - \frac{1}{4}x \rightarrow y$$

$$y = 3x + 7 \rightarrow y$$

$$x = \frac{1}{4}y + 5 \rightarrow x$$

$$x = y^2 \rightarrow \text{neither}$$

Question 4

h = height above the ground

t = time

height

time

determine the value of h when

$t = 4$ and explain its meaning

Question 5

a) $(x+1)(3x+5)$

$$3x^2 + 5x + 3x + 5$$

$$3x^2 + 8x + 5$$

b) $(x+5)^2$

$$(x+5)(x+5)$$

$$x^2 + 5x + 5x + 25$$

$$x^2 + 10x + 25$$

Question 6

The center of a circle is located at the point $(-11, 0)$.

The point $(-10, -6)$ is located on the circle.

$$(x+11)^2 + (y-0)^2 = r^2$$

$$(-10+11)^2 + (-6-0)^2 = r^2$$

$$(1)^2 + (-6)^2 \rightarrow 1 + 36 \rightarrow \sqrt{37} = r^2$$

equation

$$37 = (x - (-11))^2 + (y - 0)^2$$

Question 7

x. at least 4 units away from 17

b. write an inequality

$$x \leq 13 \quad x \geq 21$$



Question 8

all real numbers a, b, m , and n where $a > 0$ & $b > 0$?

$$\cdot a^m \cdot b^m = (ab)^m \quad \cdot \frac{a^m}{a^n} = a^{m-n} \quad a^m \cdot a^n = a^{m+n}$$

$$(a^m)^n = a^{mn}$$

Question 9

$$d = t^2 + 3t$$

a. t varies from $t=2$ to $t=4$

i constant speed? no

ii cars average speed

$$2^2 + 3(2) \rightarrow 4 + 6 \rightarrow 10$$

$$4^2 + 3(4) \rightarrow 16 + 12 \rightarrow 28$$

$$\frac{28-10}{4-2} \rightarrow \frac{18}{2} \rightarrow 9$$

b. $t = 1.4 + 0.2 \cdot 4$

i constant? no

ii average speed

$$(1.4)^2 + 3(1.4) \rightarrow 6.159899$$

$$(2.4)^2 + 3(2.4) \rightarrow 12.9599$$

Question 10

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

$$2y-6x = 6xy - 6x$$

$$3y = 3x + 3 \quad \text{implies that } y = x + 1$$

$$3(x+1) = 3x + 3$$

$$-8a(-sa+8) = 40a^2 - 64a$$

$$\frac{ab+c}{a} = b+c \quad \text{or} \quad ab+c = ab+ac$$

Question 11

$$\frac{\Delta y}{\Delta x} = 2 \quad \text{and } y=4 \text{ when } x=3$$

a. formula that expresses y in terms of x

$$y = 2x - 2 \rightarrow 2(3) - 2 \rightarrow 6 - 2 = 4$$

c. what does the graph of y in terms of x represent
All possible $x-y$ pairs of values that satisfy the relationship

Question 12

s	r
1	15
3	7
9	-17
12	-29

$$\frac{8}{2} = 4$$

$$\frac{36}{9} = 4$$

Question 13

water weight 8.35 pounds

4 gallons of water = 37.1 with tank & water
Weight combined

$$W = 8.35V + 4$$

$$8.35 \cdot 4 = 33.$$

Question 14

Question 14.

rectangular box with a square base
let x represent the length of one of the sides of the base.
The height of the box is 3 times as long as the side length, x .

a. formula

$$V = x^2 h$$

b. what if $x = 8.6$ 221.88
 $3(8.6)^2$

c. what is volume of the box is 375 cubic cm

$$\frac{375}{3} = \frac{3x^2}{3} \rightarrow 125 = x^2$$

Question 15

a. represent all values of x whose distance from 6 is less than 9.

$$|x - 6| < 9$$

b. all values of r whose distance from 4 is more than 0.8

$$|r - 4| > 0.8$$

c. all values of s whose distance from -4 is no more than 1.5.

$$|s + 4| \leq 1.5$$

Question 16

cell tower 2 miles east 6 miles north of the center of a small town

coverage of 3 miles

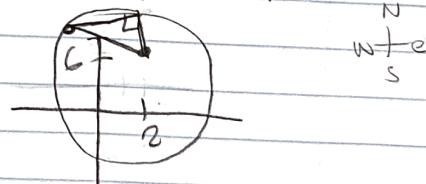
$$3^2 = (x - 2)^2 + (y - 6)^2$$

$$3^2 = (-1 - 2)^2 + (8 - 6)^2$$

$$9 =$$

$T\$$

$$6 \text{ miles} \& 8 \text{ miles} = 2 \quad x = \sqrt{3^2 - 2^2}$$
$$x = \sqrt{9 - 4}$$
$$y = \sqrt{5}$$



Question 17

A tortoise & hare - 2000 meter race

Sus head start

a. $10t + 2000 = 5t + 2000$

b. $Sus + 2000 = 5t + 2000$

c. $2000 = Sus - 5t$

d. $10(200) = 2000$

\rightarrow expression $Sus - 5t$

e. $2000 = Sus + 2000 - 5t$

$- Sus$

$2000 = 2000 + 5t - 5t$

$2000 = 2000$ \rightarrow 0 minutes

\rightarrow tortoise wins the race

1. Many students think the hare wins

2. Many students think the tortoise wins

3. Many students think the race is a tie

4. Many students think the hare wins

5. Many students think the tortoise wins