

33) Avg. Number of goals per match:

(A) Number of Goals (B) Number of MATCH w/ THIS TOTAL

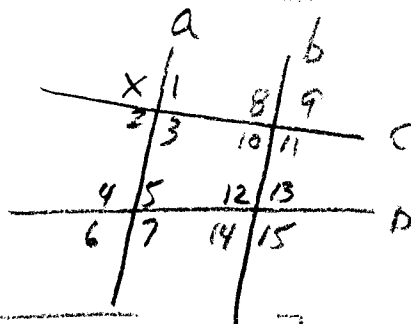
0	4	(A) · (B) ⇒	0
1	10		10
2	5		10
3	9		27
4	7		28
5	5		25
6	1		6
7	2		14
	43 MATCHES		120 goals

∴ $\frac{120 \text{ goals}}{43 \text{ MATCHES}}$

⇒ 2.8 GOALS/MATCH

$$\begin{array}{r} 002.79 \\ 43 \overline{) 120.00} \\ \underline{-86} \\ 340 \\ \underline{301} \\ 390 \\ \underline{387} \end{array}$$

34) a // b



Set $\angle$'s supplementary to $\angle X$? (180°)

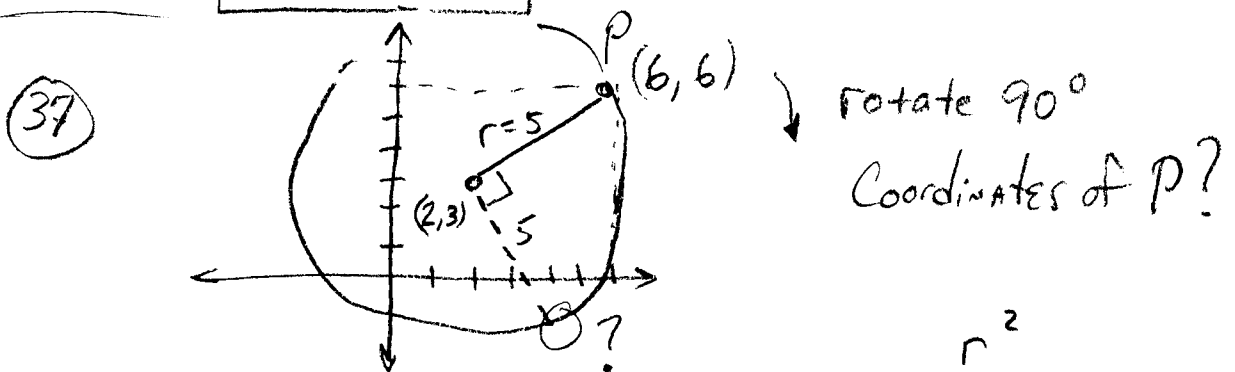
$\{\angle 1, \angle 2, \angle 9, \angle 10\}$

$$(35) \quad (3x^3)^3 = 3^3 x^9 = \boxed{27x^9}$$

$$(36) \quad \begin{array}{rcl} 4x - 8 & > & 8x + 16 \\ -8x + 8 & -8x + 8 & \end{array}$$

$$\frac{-4x}{-4} > \frac{24}{-4}$$

$$\boxed{x < -6}$$



Eg. of circle $\Rightarrow (x-2)^2 + (y-3)^2 = 25$

(A) (2, 3) } CANNOT BE ON circle

(B) (3, 2)

(C) (5, -1) $\Rightarrow$ CK $\Rightarrow (5-2)^2 + (-1-3)^2 \stackrel{?}{=} 25 \checkmark$

(D) (6, 0) $\Rightarrow$ CK $\Rightarrow (6-2)^2 + (0-3)^2 \stackrel{?}{=} 25 \checkmark$

(E) (7, 3) $\Rightarrow$ CK $\Rightarrow (7-2)^2 + (3-3)^2 \stackrel{?}{=} 25$ NO

Check distance (6, 6) to (C), (D)

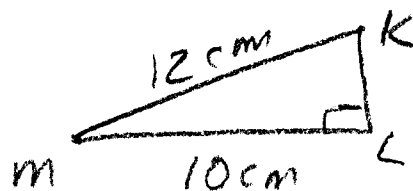
$x^2 = 5^2 + 5^2$
 $x^2 = 50$
 $x = \sqrt{50}$

(A) $d = \sqrt{(6-6)^2 + (6-0)^2} \neq \sqrt{50}$

(C) $d = \sqrt{(6-5)^2 + (6+1)^2} = \sqrt{50} \checkmark$

ANS(C) $\Rightarrow$ (5, -1)

(38) $\sin M = ?$



$$\sin M = \frac{\overline{KL}}{12}$$

$$\overline{KL}^2 + 10^2 = 12^2$$

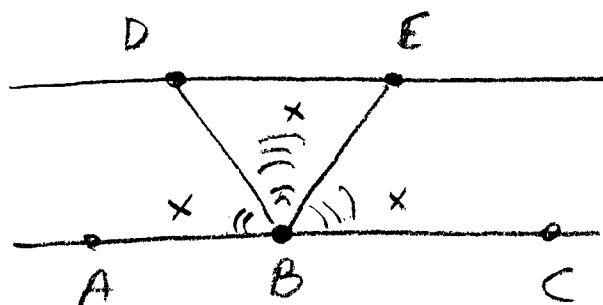
$$\overline{KL}^2 = 44$$

$$\overline{KL} = \sqrt{44} = \sqrt{4}\sqrt{11} = 2\sqrt{11}$$

$$\therefore \sin M = \frac{2\sqrt{11}}{12} = \boxed{\frac{\sqrt{11}}{6} \text{ or } \frac{\sqrt{44}}{12}}$$

↑
RADICAL SHOULD BE SIMPLIFIED

(39)



$\overline{BD}$ BISECTS $\angle ABE$

$\overline{BE}$ BISECTS $\angle CBD$

$m\angle DBE = ?$

TRANSITIVE PROPERTY

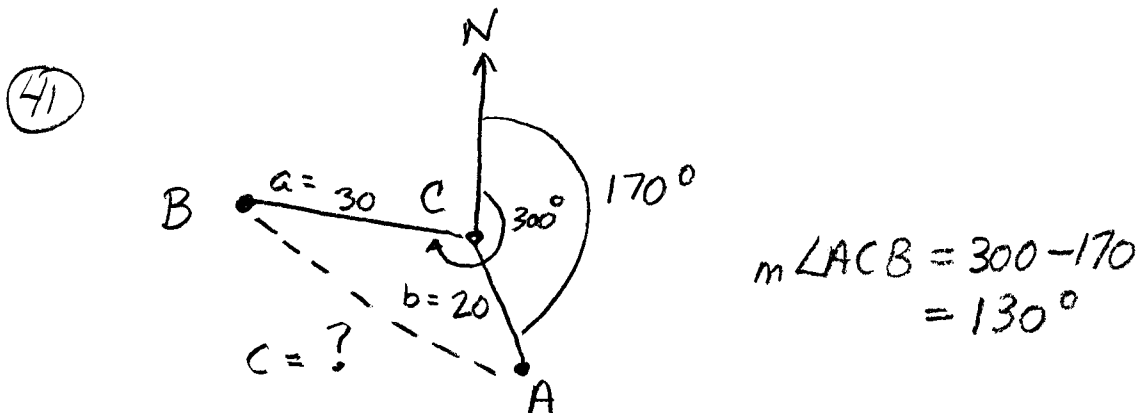
IF $m\angle ABD = m\angle DBE$

AND $m\angle DBE = m\angle EBC$

THEN $m\angle ABD = m\angle EBC$

$\therefore 3x = 180$ $\boxed{x = 60^\circ}$

40) $\frac{8 \times 10^{12} \text{ H}_2 \text{ molecules}}{4 \times 10^4 \text{ cm}^3} = \boxed{2 \times 10^8 \frac{\text{H}_2 \text{ mol.}}{\text{cm}^3}}$



$$c^2 = a^2 + b^2 - 2ab \cos C$$

$$\boxed{C = \sqrt{30^2 + 20^2 - 2(30)(20)\cos(130^\circ)}}$$

42) WHAT RATIONAL number halfway between $\frac{1}{5}$ and $\frac{1}{3}$

$$\frac{1}{5} \downarrow \frac{3}{15} \quad \boxed{\frac{24}{15}} \quad \frac{5}{15} \downarrow \frac{1}{3}$$

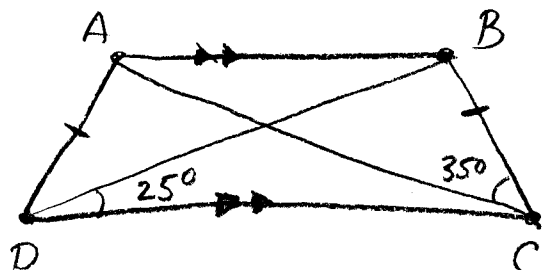
43) Isosceles Trapezoid
 $m\angle DBC = ?$

$$m\angle D = m\angle C$$

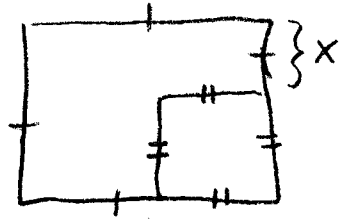
$$\therefore \triangle ADC \cong \triangle BCD \Rightarrow \text{SAS} \quad \therefore m\angle DCA = 25^\circ \quad \text{CPCTC}$$

$$\therefore m\angle C = 35 + 25 = 60^\circ$$

$$\therefore m\angle DBC = 180 - 60 - 25 = \boxed{95^\circ}$$



44



$$A_{\square} = 50 \text{ cm}^2$$

$$A_{\square} = 18 \text{ cm}^2$$

$$x = ?$$

$$A_{\square} = \sqrt{50} \cdot \sqrt{50}$$

$$A_{\square} = \sqrt{18} \cdot \sqrt{18}$$

$$\therefore x = \sqrt{50} - \sqrt{18}$$

$$\sqrt{25\sqrt{2}} - \sqrt{9\sqrt{2}}$$

$$5\sqrt{2} - 3\sqrt{2}$$

$$= \boxed{2\sqrt{2} = x}$$

45 RATIONAL? (A) $\sqrt{2}$ NO

(B) $\sqrt{7}$ NO

(C) $\sqrt{7}$ NO

$$(D) \sqrt{\frac{5}{25}} = \frac{\sqrt{5}}{5} = \text{NO}$$

$$(E) \sqrt{\frac{64}{49}} = \frac{\sqrt{64}}{\sqrt{49}} = \frac{8}{7} = \text{YES}$$

46 $a < b$, then $|a-b| = ?$

$$+(a-b) \quad \swarrow \text{and} \quad \searrow$$

$$\downarrow$$

$$\boxed{\text{(K) ANS}}$$

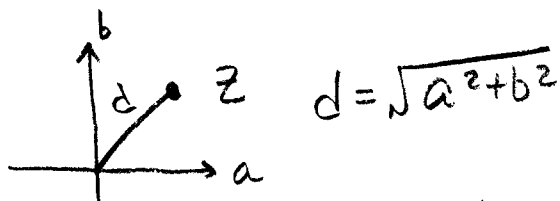
④⑦. 5 of 8 tests done, Avg = 78.0
Points on test 6 to get Avg = 80.0?

$$\frac{(5 \cdot 78) + X}{6} = 80$$

$$\begin{array}{r} 390 + X = 480 \\ - 390 \quad \quad - 390 \end{array}$$

$$\boxed{X = 90}$$

(48)



Since Z_1 is farthest away from the origin,
 Z_1 has the greatest modulus.

(49)

$$8^{2x+1} = 4^{1-x}$$

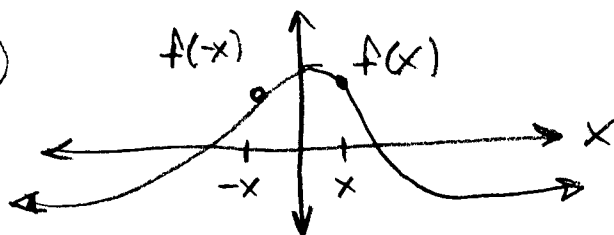
$$2^{3(2x+1)} = 2^{2(1-x)}$$

$$\therefore 6x+3 = 2-2x$$

$$8x = -1$$

$$x = -\frac{1}{8}$$

(50)



Since $f(x) = f(-x) \Rightarrow$ Even Function

(51) 100 - 999 inclusive $\Rightarrow$ 900 numbers

100, 101, 102, ..., 109

110, ..., 119

↓ 120

...

190

200 $\rightarrow$ 29...

3 $\rightarrow$ 999 $\Rightarrow$

$\Rightarrow 10$

$\Rightarrow 1$

$\Rightarrow 8$

10
9
19
7-19

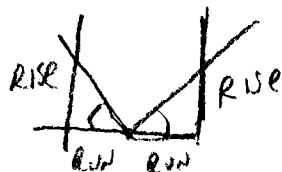
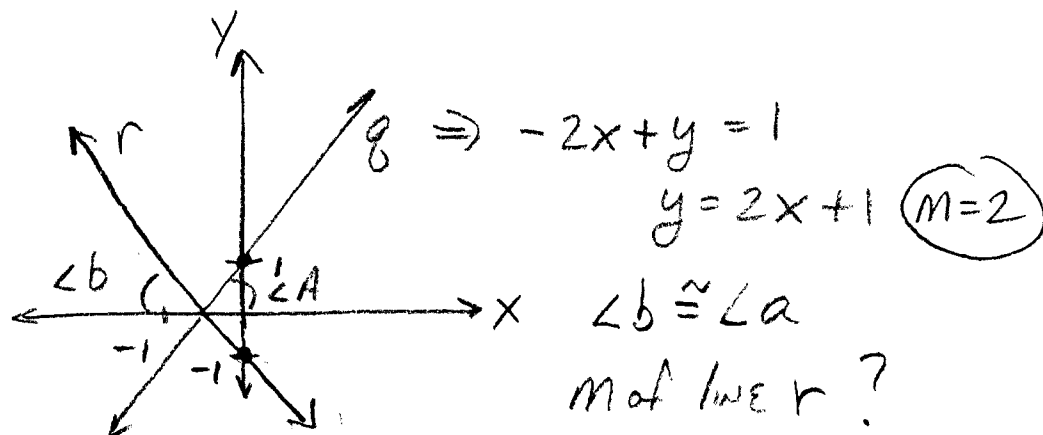
38
133
171

Ans.

↓

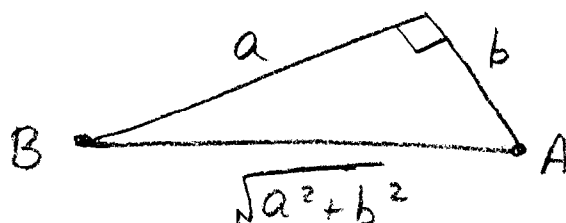
171
900

(52)



$\therefore$ $m \text{ of } r = -2$

(53)



$0 < b < a$

Angle $\Rightarrow \tan^{-1}\left(\frac{a}{b}\right)$

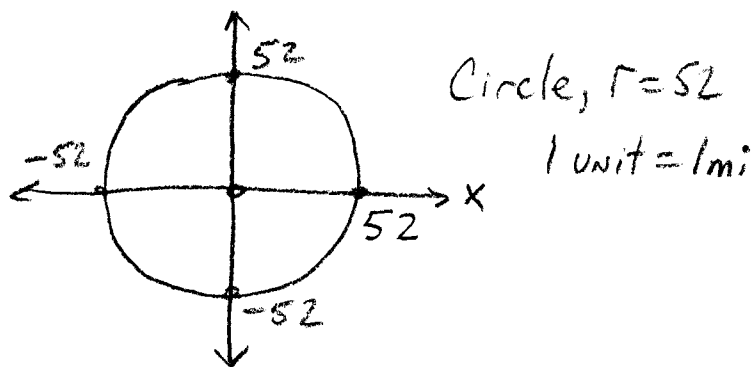
$\cos\left[\tan^{-1}\left(\frac{a}{b}\right)\right]?$

$A = \tan^{-1}\left(\frac{a}{b}\right)$

A is the angle
 whose tan is $\frac{a}{b}$

$\therefore$ $\cos[A] = \frac{b}{\sqrt{a^2 + b^2}}$

Use for 54-56
Radio transmitter:



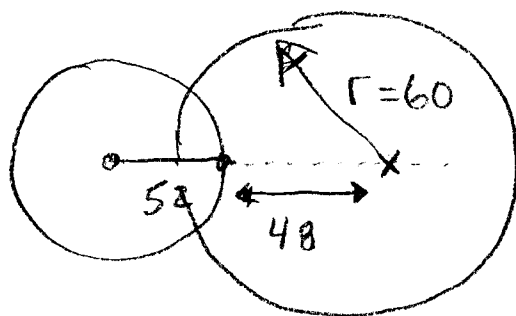
$$\textcircled{54} \quad A_{\odot} = \pi r^2 = 3.14(52)^2 \approx 3.14(2704) \\ \approx \boxed{8491 \approx 8500 \text{ mi}^2}$$

$\textcircled{55}$ Eq of circle: $h=0 \quad k=0$

$$\therefore (x-h)^2 + (y-k)^2 = r^2$$

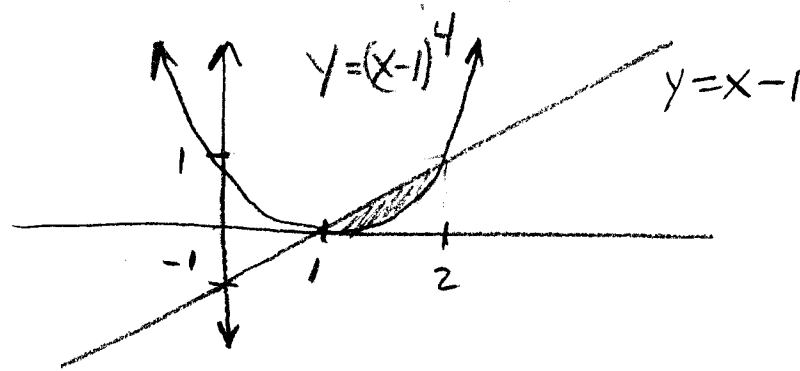
$$\boxed{x^2 + y^2 = 2704 = 52^2}$$

$\textcircled{56}$ New station 100 mi. away w/ $r=60$ mi.
How many miles along highway can both
be heard?



$\underbrace{\hspace{2cm}}$
 $\boxed{\text{OVERLAP is 12 miles}}$

(57)



$$(x-1)^4 < (x-1)$$

THIS < THIS
graph graph

ONLY IN SHADED
Region $\Rightarrow$

$$1 < x < 2$$

"Spot check"

$$\left(\frac{3}{2}-1\right)^4 \stackrel{?}{<} \left(\frac{3}{2}-1\right)$$

Since $\frac{3}{2}$ is in shaded region

$$\left(\frac{1}{2}\right)^4 \stackrel{?}{<} \frac{1}{2} \quad \checkmark$$

$$(0-1)^4 \stackrel{?}{\neq} (0-1)$$

$$1 \stackrel{?}{\neq} -1 \quad \checkmark$$

$$(3-1)^4 \stackrel{?}{\neq} (3-1)$$

$$2^4 \neq 2 \quad \checkmark$$

58) $x > 0$, 2 digits $\Rightarrow 10 \rightarrow 99$

$$x = tu$$

$$y = ut$$

$$x - y = ?$$

$$tu - ut$$

$$\boxed{ut(1-1) = 0}$$

OK: $\overset{+u}{36} - \overset{+t}{63} \stackrel{?}{=} 0$
 (PICK A NUMBER) $x \quad y \quad \text{NO!}$ UH OH...
 Regroup, rethink!
 $30+6 - 60+3$

$$x \neq tu \quad y \neq ut$$

$$x = t+u \quad y = u+t$$

$$\therefore x - y = t+u - (u+t)$$

$$t+u - u - t = 0 \quad \text{OH! NO!}$$

OK, let's get real...

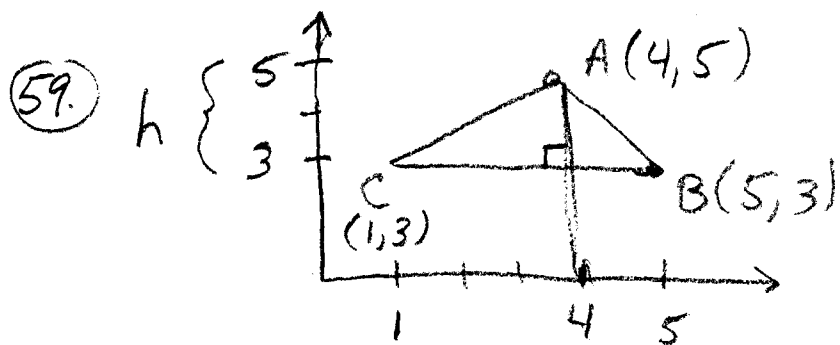
$$x = 10(t) + 1(u) \quad y = 10(u) + 1(t)$$

$$x - y = 10t + u - (10u + t)$$

$$10t + u - 10u - t$$

$$9t - 9u = \boxed{9(t-u)}$$

OK: $\overset{+u}{36} - 63 \stackrel{?}{=} 9(3-6) = -27 \quad ? \checkmark \text{ WOOHOO!}$



$$A_{\Delta} = \frac{1}{2}bh = \frac{1}{2}(5-1)(5-3)$$

$$= \frac{1}{2}(4)(2) = \boxed{4 \text{ units}^2}$$

60. $Sum = \frac{a_1}{1-r} \quad r < 1$
 $a_1 = \text{first term}$

$$200 = \frac{a_1}{1-.15}$$

$$\therefore .85(200) = a_1$$

$$\frac{85}{100} \cdot 200 = a_1 = 170 = a_1$$

$$\therefore \text{second term} = (a_1)(r)$$

$$= 170 \left(\frac{15}{100} \right) = \boxed{25.5 = a_2}$$

STOP 😊