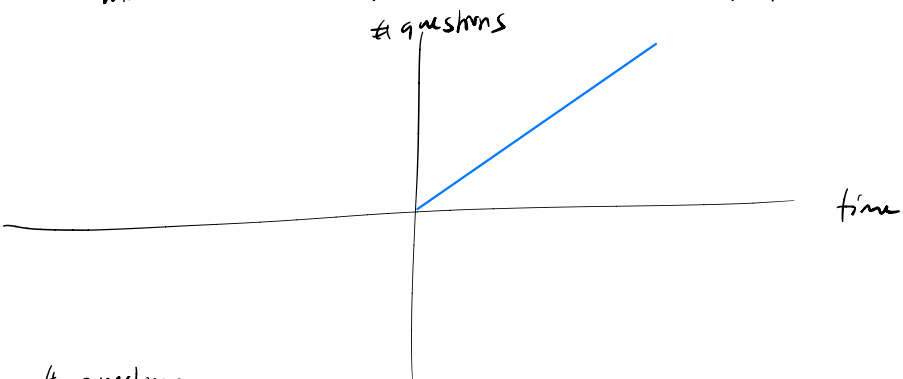
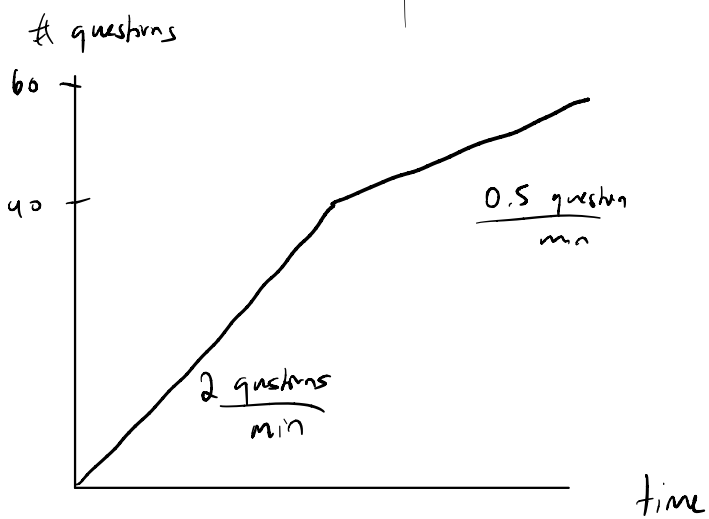
Group 6
Lang
2-19-22 Tutoring

First 40
1 question / min

Last 20
1 question / min

60 questions / 60 min

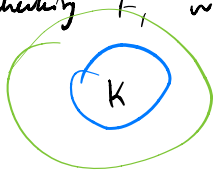



expected value — mean, average

22)

1) After checking F, which answer do you check?




check outliers

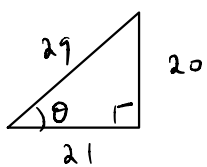
2) $\frac{82 + 88 + 91 + 83 + \boxed{196}}{6} = 90\%$

| points | |
|---|---|
| 4 × | 100 |
| + 1 × | 200 |
| | 600 pts |

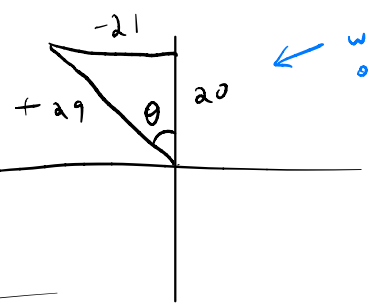
Read carefully

30) $90° < \theta < 180°$ ↗ cos θ will be negative

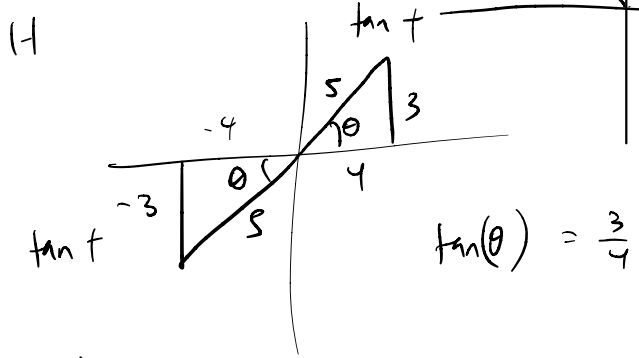
$0 < \theta < 90°$




What's cos θ? $\frac{21}{29}$




← wrong orientation, ignore




$\tan(\theta) = \frac{3}{4}$

$\tan = \frac{opp}{adj}$

| | |
|---|---|
| sin | $2\pi$ |
| cos | $2\pi$ |
| tan | period of $\pi$ |

37)
46) Guess & check good approach, saves time

$\log_5 x = -2$ (result = $x$, base = 5, power = $-2$)

$5^2 = 25$ ) $\div 5$
$5^1 = 5$ ) $\div 5$
$5^0 = 1$ ) $\div 5$
$5^{-1} = 1/5$ ) $\div 5$
$5^{-2} = 1/25$ ) $\div 5$

$5^{-2} = x = \frac{1}{5^2} = \frac{1}{25}$

$5^2$ "multiply 5 two times" $5 \cdot 5$

$5^{-2}$ "do the inverse of multiplying 5 two times" $\frac{1}{5 \cdot 5}$

49)

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

want: angle $\rightarrow C$ $\quad -\frac{c^2 - a^2 - b^2}{2ab} = \cos C$

$\cos^{-1}\left(-\frac{c^2 - a^2 - b^2}{2ab}\right) = \cos^{-1}(\cos(C))$

$\cos^{-1}\left(-\frac{c^2 - a^2 - b^2}{2ab}\right) = C$

B $\quad c = 39$

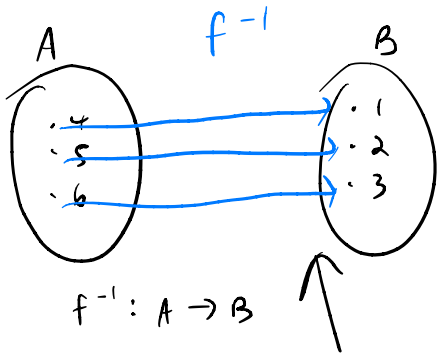
Apply something to C
Then do the opposite

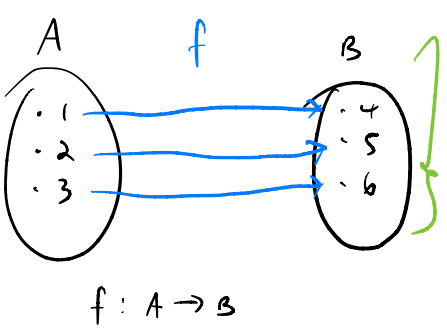
## LAW OF COSINES

Figure out what $c$ and $C$ are
You are solving for one of them

NEVER a or b

Inverse Function




52) recursive formulas are not explicit formulas

usually have to plug in several times

$n=1$ $s_1 = 3$

$n=2$ $s_2 = 2s_{2-1} + n + 1 = 2s_1 + 2 + 1 = 2(3) + 2 + 1 = 9$

$n=3$ $s_3 = 22$

$n=4$ $s_4 = 49$

Fibonacci

$s_n = s_n + 1$ ∅

$s_1 = 1 = 2 = 3 = 4 \cdots$

$s_1 = s_1 + 1 = 2$

54) $\{1, 2, 2, 3, 3, 3, 4, 4, 4, 4\}$

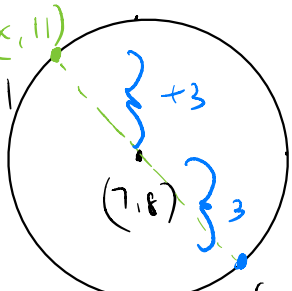
$$EX = \frac{1\cdot 1 + 2\cdot 2 + 3\cdot 3 + 4\cdot 4}{10} = 3$$

58)

Remember: for geometry questions, always draw a diagram

Center: $(7, 8)$

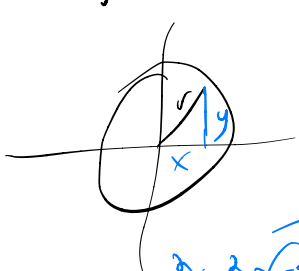
Radius: $\sqrt{10} \approx 3.1$




$(x, 8-3)$

$= (x, 5)$

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




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

Want:

60) Must be 3 solutions (may be imaginary)

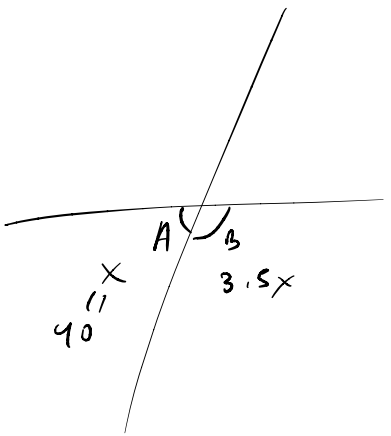
Send complex solution graph later

$(x-1)^2$ $(x-1)(x-1)$

$x = 1$ $x=1$ $x=1$

Any polynomial with highest power $n$ (of degree $n$) has $n$ solutions (may be hidden) (maybe imaginary)

51)




$x + 3.5x = 180$

$4.5x = 180$

$x = 40$

Always one or two small steps from correct answer, attempt every question and draw diagram / do small example

Try to keep track of questions you took too long on

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Fibonacci sequence

1, 1, 2, 3, 5, 8, 13, 21, 34

$f_1 = 1$

$f_2 = 1$

$f_n = f_{n-1} + f_{n-2}$