8-24-17 1st Trig

$$\frac{2}{11} + \frac{3}{11} = \frac{2+3}{11} = \frac{5}{11}$$

$$\frac{n}{15} + \frac{7}{15} = \frac{n+7}{15}$$

$$\frac{6n+20}{2} = \frac{6n}{2} + \frac{20}{2}$$

$$= 3n + 10$$

$$\frac{4n-8}{4} = \frac{4n}{4} + \frac{-8}{4}$$

$$= n - 2$$

Instead of seperating it into its parts, we can simplify at start

$$\frac{\cancel{4}n-\cancel{8}^{2}}{\cancel{4}_{1}} = \frac{n-2}{1} = n-2$$

① $\frac{9n+12}{3}$ $\frac{3n+4}{1} = 3n+4$

② $\frac{8+\sqrt{8}}{2} = \frac{8+2\sqrt{2}}{2}$

$= 4+\sqrt{2}$

③ $\frac{6+\sqrt{12}}{4} = \frac{6+2\sqrt{3}}{4}$

$\frac{3+\sqrt{3}}{2}$

④ $\frac{-15\pm\sqrt{50}}{5} = \frac{-15\pm 5\sqrt{2}}{5}$

$-3\pm\sqrt{2}$

⑤ $\frac{6 \pm \sqrt{-48}}{4} = \frac{\overset{3}{\cancel{6}} \pm \overset{2}{\cancel{4}} \cdot i\sqrt{3}}{\cancel{4}_{2}}$

$\frac{3 \pm 2 \cdot i\sqrt{3}}{2}$

48
8 6
4 2 3 2
2 2

$\sqrt{-48} = 2i\sqrt{-1 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3}$

$4 \cdot i\sqrt{3}$

⑥ Trick $\frac{10 \pm \sqrt{16}}{2} = \frac{\overset{5}{\cancel{10}} \pm \overset{2}{\cancel{4}}}{\cancel{2}_{1}} = 5 \pm 2$

7, 3

⑦ $\frac{-16 \pm \sqrt{-32}}{4} = \frac{\overset{-4}{-16} \pm \overset{1}{4} \cdot i\sqrt{2}}{\cancel{4}_{1}}$

$-4 \pm i\sqrt{2}$

SAT thought

How many of the first fifty positive integers contain a 3?

1
2
3
4

10
11
:
20
21

3, 13, 23, 30, 31, 32, 33, 34

35, 36, 37, 38, 39, 43

14

8-24-17 3rd Trig

$\frac{2}{13} + \frac{5}{13} = \frac{7}{13}$ $\frac{2+5}{13}$

Cut it with a knife into equal size slices

$\frac{n}{9} + \frac{2}{9} = \frac{n+2}{9}$

$\frac{3n+8}{11} = \frac{3n}{11} + \frac{8}{11}$

$\frac{6n+15}{3} = \frac{\cancel{6}^{2}n}{\cancel{3}_{1}} + \frac{\cancel{15}^{5}}{\cancel{3}_{1}}$

$2n+5$

$\frac{6n+8}{2} = \frac{6n}{2} + \frac{8}{2}$

$3n+4$

You can seperate it into its parts

OR

$\frac{\cancel{6}^{3}n+\cancel{8}^{4}}{\cancel{2}_{1}} = \frac{3n+4}{1} = 3n+4$

$\frac{3n+7}{2}$

① $\dfrac{6+\sqrt{8}}{2} = \dfrac{\cancel{6}^{3}+\cancel{2}^{1}\sqrt{2}}{\cancel{2}_{1}}$

$3+\sqrt{2}$

② $\dfrac{10+\sqrt{20}}{2} = \dfrac{\cancel{10}^{5}+\cancel{2}^{1}\sqrt{5}}{\cancel{2}_{1}}$

$= 5+\sqrt{5}$

③ $\dfrac{6+\sqrt{12}}{4} = \dfrac{\cancel{6}^{3}+\cancel{2}^{1}\sqrt{3}}{\cancel{4}_{2}}$

$= \dfrac{3+\sqrt{3}}{2}$

④ $\dfrac{15+\sqrt{50}}{10} = \dfrac{\cancel{15}^{3}+\cancel{5}^{1}\sqrt{2}}{\cancel{10}_{2}}$

$\dfrac{3+\sqrt{2}}{2}$

⑤ $\dfrac{18\pm\sqrt{18}}{4} = \dfrac{18\pm 3\sqrt{2}}{4}$

As far as it goes

⑥ $\frac{12 \pm \sqrt{-20}}{4} = \frac{\overset{6}{\cancel{12}} \pm \overset{1}{\cancel{2}} i\sqrt{5}}{\cancel{4}_2}$

$$\frac{6 \pm i\sqrt{5}}{2}$$

⑦ $\frac{25 \pm \sqrt{-50}}{100} = \frac{\overset{5}{\cancel{25}} \pm \overset{1}{\cancel{5}} i\sqrt{2}}{\cancel{100}\ 20}$

$$\frac{5 \pm i\sqrt{2}}{20}$$

⑧ $\frac{2 \pm \sqrt{-28}}{4}$ $\quad \frac{\overset{1}{\cancel{2}} \pm \overset{1}{\cancel{2}} \cdot \sqrt{7}}{\cancel{4}_2}$

$$\frac{1 \pm i\sqrt{7}}{2}$$

SAT

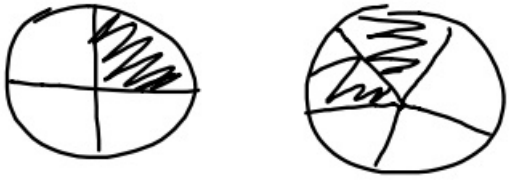
How many of the first fifty positive integers contain the digit 3?

3
13
23
30-39 → 10
43

14

8-24-17 4th Try

$\frac{2}{19} + \frac{4}{19} = \frac{6}{19}$ $\frac{2+4}{19}$



$\frac{n}{11} + \frac{4}{11} = \frac{n+4}{11}$

$\frac{3n+5}{19} = \frac{3n}{19} + \frac{5}{19}$

$\frac{4n+1}{5} = \frac{4n}{5} + \frac{1}{5}$

$\frac{8n+10}{2} = \frac{8n}{2} + \frac{10}{2}$

$4n + 5$

I could

$\frac{\cancel{8}^{4}n+\cancel{10}^{5}}{\cancel{2}_{1}} = 4n+5$

① $\frac{8+\sqrt{12}}{2} = \frac{\overset{4}{\cancel{8}}+\overset{1}{\cancel{2}}\sqrt{3}}{\underset{1}{\cancel{2}}}$

$4+\sqrt{3}$

② $\frac{10+\sqrt{8}}{2} = \frac{\overset{5}{\cancel{10}}+\overset{1}{\cancel{2}}\sqrt{2}}{\underset{1}{\cancel{2}}}$

$5+\sqrt{2}$

③ $\frac{15\pm\sqrt{50}}{10}$ $\frac{\overset{3}{\cancel{15}}\pm\overset{1}{\cancel{5}}\sqrt{2}}{\cancel{10}\ 2}$

$\frac{3\pm\sqrt{2}}{2}$

④ $\frac{6\pm\sqrt{18}}{12} = \frac{\overset{2}{\cancel{6}}\pm\overset{1}{\cancel{3}}\sqrt{2}}{\cancel{12}_{4}}$

$\frac{2\pm\sqrt{2}}{4}$

⑤ $\frac{3\pm\sqrt{-27}}{9} = \frac{\overset{1}{\cancel{3}}\pm\overset{1}{\cancel{3}}i\sqrt{3}}{\cancel{9}_{3}}$

$\frac{1\pm i\sqrt{3}}{3}$

⑥ $\frac{6 \pm \sqrt{45}}{12} = \frac{6 \pm 3\sqrt{5}}{12}$

$\frac{2 \pm \sqrt{5}}{4}$

⑦ $\frac{-2 \pm \sqrt{200}}{2} = \frac{-2 \pm 10\sqrt{2}}{2}$

$-1 \pm 5\sqrt{2}$

SAT

How many of the first fifty positive integers contain the digit 2?

2
12
20-29 → 10
32
42

14