Test 6

#10 $\sqrt{-2160}$

$= i\sqrt{2160}$

$= i\sqrt{2\cdot 2\cdot 2\cdot 2\cdot 3\cdot 3\cdot 3\cdot 5}$

$2\cdot 2\cdot 3\, i\sqrt{15} = 12i\sqrt{15}$

$i\sqrt{2^4\cdot 3^3\cdot 5} = i\sqrt{2^4\cdot 3^2\cdot 3\cdot 5}$

$= i\,2^{\frac{4}{2}}\cdot 3^{\frac{2}{2}}\sqrt{3\cdot 5}$

$= i\cdot 2^2\cdot 3\sqrt{15}$

$= 12i\sqrt{15}$

$$\begin{array}{r|l} 2 & 2160 \\ 2 & 1080 \\ 2 & 540 \\ 2 & 270 \\ 3 & 135 \\ 3 & 45 \\ 3 & 15 \\ & 5 \end{array}$$

$3^3 = 3^{2+1} = 3^2\cdot 3^1$

$\sqrt{2^7\cdot 3^{21}\cdot 5^{371}\cdot x^{25}}$

$= \sqrt{2^6\cdot 2^1\cdot 3^{20}\cdot 3^1\cdot 5^{370}\cdot 5^1\cdot x^{24}\cdot x^1}$

$= 2^3\cdot 3^{10}\cdot 5^{185}\, x^{12}\sqrt{2\cdot 3\cdot 5x}$

$\sqrt[3]{2^7\cdot 3^{21}\cdot 5^{371}\cdot x^{25}\cdot 7^{131}}$

$\sqrt[3]{2^6\cdot 2^1\cdot 3^{21}\cdot 5^{369}\cdot 5^2\cdot 7^{129}\cdot 7^2\cdot x^{24}\cdot x^1}$

$= 2^{\frac{6}{3}}\cdot 3^{\frac{21}{3}}\cdot 5^{\frac{369}{3}}\cdot 7^{\frac{129}{3}}\cdot x^{\frac{24}{3}}\sqrt[3]{2\cdot 5^2\cdot 7^2\cdot x}$

$= 2^2\cdot 3^7\cdot 5^{123}\cdot 7^{43}\cdot x^8\sqrt[3]{2\cdot 5^2\cdot 7^2\cdot x}$

$\frac{371}{3} = 123.\overline{6}$

$(123)(3) = 369$

$371 - 369 = 2$

$\frac{131}{3} = 43.\overline{66}$

$(43)(3) = 129$

$131 - 129 = 2$

#11

$$\sqrt{-3}\,\sqrt{-16} = (i\sqrt{3})(i\sqrt{16})$$

$$= i^2\sqrt{3}\,\sqrt{16}$$

$$= -(\sqrt{3})(4) = -4\sqrt{3}$$

$\sqrt{a}\,\sqrt{b} = \sqrt{ab}$, if $\sqrt{a}$ & $\sqrt{b}$ are real.

* $i^2 = -1$

* $(a+b)(a-b) = a^2 - b^2$

$$(36x+7)(36x-7) = (36x)^2 - 7^2 = 36^2x^2 - 7^2$$

$$(a+bi)(a-bi) = a^2 - (bi)^2 = a^2 - b^2 i^2 = a^2 + b^2$$

#11b $$\left(\frac{5+4i}{2+5i}\right)\left(\frac{2-5i}{2-5i}\right) = \frac{10-25i+8i-20i^2}{2^2+5^2}$$

$2^2-(5i)^2$

$$\frac{10-17i+20}{4+25} = \frac{30-17i}{29}$$ is OK

$$= \frac{30}{29} - \frac{17}{29}i$$ is Baby Bear's porridge.

$$= \frac{30}{29} + \left(-\frac{17}{29}\right)i$$ is formal

$$\frac{\left(-3x^{\frac{3}{4}}\right)^5}{x^{-\frac{2}{7}}} = \frac{(-3)^5\left(x^{\frac{3}{4}}\right)^5}{x^{-\frac{2}{7}}}$$

$(-3x)^{3/4} \neq -3x^{3/4}$

$x^{\frac{3}{4}\cdot 5}$

$\frac{3}{4}\cdot\frac{5}{1} = \frac{15}{4}$

$$= \frac{-3^5 x^{\frac{15}{4}}}{x^{-\frac{2}{7}}} = \frac{-3^5 x^{\frac{15}{4}} x^{\frac{2}{7}}}{1}$$

LCD = 7·4

$$= -3^5 x^{\frac{15}{4}+\frac{2}{7}} = \boxed{-243x^{\frac{113}{28}}} = -243\sqrt[28]{x^{113}}$$

$$\frac{15}{4}\cdot\frac{7}{7} + \frac{2}{7}\cdot\frac{4}{4} = \frac{105+8}{28} = \frac{113}{28}$$

$-3 = \frac{1}{3}$ No.

No Test 3 (Take-home) stuff on Final

$-3^5 = (-3)^5$ because 5 is odd:

$(-3)^5 = ((-1)(3))^5$

$= (-1)^5(3)^5$

$= \underbrace{(-1)(-1)}\underbrace{(-1)(-1)}(-1)(3)^5$

$= -1\cdot 3^5 = -3^5$

$(-3)^4 = 3^4$

$-3^4 = -$