October 17, 2023

6)

$$0 = -\frac{1}{2}x^2 - 24$$

$$-2 \cdot 24 = +\frac{1}{2}x^2 \cdot -2$$

$$\sqrt{-48} = \sqrt{x^2}$$
$$16 \cdot 3$$
$$\pm 4i\sqrt{3} = x$$

3)

$$\frac{\gamma\sqrt{60}}{\frac{3\cancel{8}\sqrt{6}}{5}} \cdot = \frac{\sqrt{10}}{5}$$

5)

$$\frac{4 - 3\sqrt{6}}{2 + \sqrt{6}} \cdot \frac{(2 - \sqrt{6})}{(2 - \sqrt{6})}$$

$$= \frac{8 - 4\sqrt{6} - 6\sqrt{6} + \overset{18}{3 \cdot 6}}{4 - 6}$$

$$= \frac{-26 + 10\sqrt{6}}{+2}$$

$$= \boxed{-13 + 5\sqrt{6}}$$

8)

$$i^{38} - 2i^{103} + i^{320}$$

$$\frac{38}{4} = 9.5 \quad i^3 + \quad 1$$
$$i^2$$

$$-1 - 2(-i) + 1$$

$$\cancel{-1} + 2i + \cancel{1}$$

$$= \boxed{2i}$$

9)

$$(2i)^3 (3i)^2$$

$$8i^3 \cdot 9i^2$$

$$-8i \cdot -9$$

$$= 72i$$

14) <u>Solve.</u>

$$2(x+5)^2 + 11 = 29$$
$$\qquad\qquad -11 \quad -11$$

$$\frac{2(x+5)^2}{2} = \frac{18}{2}$$

$$\sqrt{(x+5)^2} = \sqrt{9}$$

$$x + 5 = \overset{+}{\underset{-5}{}}3$$
$$\quad -5$$

$$x = -5 \pm 3$$
$$\quad -5+3 \quad -5-3$$

$$\boxed{x = -2, -8}$$

LOG REVIEW

1c) $\quad \left(2^{-1} + 4^{-3/2}\right)^{-1}$

$\left(\frac{1}{2} + \frac{1}{\sqrt[3]{4^3}}\right)^{-1}$

$\left(\frac{1}{2} + \frac{1}{8}\right)^{-1}$

$\left(\frac{4}{8} + \frac{1}{8}\right)^{-1}$

$\left(\frac{5}{8}\right)^{-1}$

$= \boxed{\frac{8}{5}}$

d-f) — Make common bases

$\log_7 \frac{1}{49} = \log_7 7^{-2} = -2$

g-i) $\quad e^{3\ln 2^3} = e^{\ln 2^3}$

$\qquad\qquad = 8$

Like
3(i)

$$\ln 2x + \ln (x-1) = 3$$

$$\ln (2x^2 - 2x) = 3$$

$$2x^2 - 2x = e^3$$

Quadratic formula

$$2x^2 - 2x - e^3 = 0$$

$$x = \frac{2 \pm \sqrt{4 - 4(2)(-e^3)}}{2(2)}$$

$$= \frac{2 \pm \sqrt{4 + 8e^3}}{4}$$

Check!

$$7^{x+3} = 2^{3x-1} \quad \leftarrow \text{ can use } \ln x \text{ or } \log x$$

$$\ln(7)^{x+3} = \ln(2)^{3x-1}$$

$$(x+3)\ln 7 = (3x-1)\ln 2$$

$$x\ln 7 + 3\ln 7 = 3x\ln 2 - \ln 2 \quad \leftarrow \text{ get x's on one side } \#\text{'s on other side}$$

$$x\ln 7 - 3x\ln 2 = -3\ln 7 - \ln 2$$

$$x(\ln 7 - 3\ln 2) = -3\ln 7 - \ln 2$$

$$x = \frac{-3\ln 7 - \ln 2}{\ln 7 - 3\ln 2}$$

$$x = \_\_.\_\_\_\_$$

m) **Factor**

$$e^{2x} - 3e^x - 28 = 0$$

$$(e^x - 7)(e^x + 4) = 0$$

$$e^x = -4$$

$$x = \ln(-4)$$