

Simplify.

1.) $\sqrt{-32}$

$$\begin{aligned} &\sqrt{-1} \sqrt{16} \sqrt{2} \\ &i \cdot 4 \cdot \sqrt{2} \\ &\boxed{4i\sqrt{2}} \end{aligned}$$

2.) $\sqrt{20}$

$$\begin{aligned} &\sqrt{4} \sqrt{5} \\ &\boxed{2\sqrt{5}} \end{aligned}$$

3.) $\sqrt{-60}$

$$\begin{aligned} &\sqrt{-1} \sqrt{4} \sqrt{15} \\ &i \cdot 2 \cdot \sqrt{15} \\ &\boxed{2i\sqrt{15}} \end{aligned}$$

4.) $\sqrt{75}$

$$\begin{aligned} &\sqrt{25} \sqrt{3} \\ &\boxed{5\sqrt{3}} \end{aligned}$$

5.) $\sqrt{72}$

$$\begin{aligned} &\sqrt{36} \sqrt{2} \\ &\boxed{6\sqrt{2}} \end{aligned}$$

6.) $\sqrt{-9}$

$$\begin{aligned} &\sqrt{-1} \sqrt{9} \\ &i \cdot 3 \\ &\boxed{3i} \end{aligned}$$

7.) $\sqrt{56}$

$$\begin{aligned} &\sqrt{4} \sqrt{14} \\ &\boxed{2\sqrt{14}} \end{aligned}$$

8.) $\sqrt{-30}$

$$\begin{aligned} &\sqrt{-1} \sqrt{30} \\ &i \cdot \sqrt{30} \\ &\boxed{i\sqrt{30}} \end{aligned}$$

9.) $\sqrt{-4}$

$$\begin{aligned} &\sqrt{-1} \sqrt{4} \\ &i \cdot 2 \\ &\boxed{2i} \end{aligned}$$

10.) $\sqrt{80}$

$$\begin{aligned} &\sqrt{16} \sqrt{5} \\ &\boxed{4\sqrt{5}} \end{aligned}$$

11.) $\sqrt{-33}$

$$\begin{aligned} &\sqrt{-1} \sqrt{33} \\ &i \cdot \sqrt{33} \\ &\boxed{i\sqrt{33}} \end{aligned}$$

12.) $\sqrt{-24}$

$$\begin{aligned} &\sqrt{-1} \sqrt{4} \sqrt{6} \\ &i \cdot 2 \cdot \sqrt{6} \\ &\boxed{2i\sqrt{6}} \end{aligned}$$

Simplify. Leave answers in simplified radical form.

13.) $x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(8)(2)}}{2(8)}$

$$x = \frac{3 \pm \sqrt{9 - 64}}{16}$$

$$x = \frac{3 \pm \sqrt{-55}}{16}$$

$$\boxed{x = \frac{3 \pm i\sqrt{55}}{16}}$$

14.) $x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(3)(-7)}}{2(3)}$

$$x = \frac{-12 \pm \sqrt{144 + 84}}{6}$$

$$x = \frac{-12 \pm \sqrt{228}}{6}$$

$$x = \frac{-12 \pm \sqrt{4} \sqrt{57}}{6}$$

$$x = \frac{-12 \pm 2\sqrt{57}}{6}$$

$$\boxed{x = \frac{-6 \pm \sqrt{57}}{3}}$$

15.) $x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(5)(7)}}{2(5)}$

$$x = \frac{-10 \pm \sqrt{100 - 140}}{10}$$

$$x = \frac{-10 \pm \sqrt{-40}}{10}$$

$$x = \frac{-10 \pm \sqrt{-1} \sqrt{4} \sqrt{10}}{10}$$

$$x = \frac{-10 \pm 2i\sqrt{10}}{10}$$

$$\boxed{x = \frac{-5 \pm i\sqrt{10}}{5}}$$

16.) $x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(-3)(-5)}}{2(-3)}$

$$x = \frac{6 \pm \sqrt{36 - 60}}{-6}$$

$$x = \frac{6 \pm \sqrt{-24}}{-6}$$

$$x = \frac{6 \pm \sqrt{-1} \sqrt{4} \sqrt{6}}{-6}$$

$$x = \frac{6 \pm 2i\sqrt{6}}{-6}$$

$$\boxed{x = \frac{3 \pm i\sqrt{6}}{-3}}$$

Evaluate.

17.) If $f(x) = -2x^2 - 4x + 7$, find $f(3)$.

$$\begin{aligned} f(3) &= -2(3)^2 - 4(3) + 7 \\ &= -2(9) - 4(3) + 7 \\ &= -18 - 12 + 7 \\ &= -23 \end{aligned}$$

18.) If $g(x) = 3x^2 + 5x - 4$, find $g(-4)$.

$$\begin{aligned} g(-4) &= 3(-4)^2 + 5(-4) - 4 \\ &= 3(16) + 5(-4) - 4 \\ &= 48 - 20 - 4 \\ &= 28 - 4 \\ &= 24 \end{aligned}$$

19.) If $h(x) = -x^2 + 3x$, find $h(m+2)$.

$$\begin{aligned} h(m+2) &= -(m+2)^2 + 3(m+2) \\ &= -(m+2)(m+2) + 3(m+2) \\ &= -(m^2 + 4m + 4) + 3(m+2) \\ &= -m^2 - 4m - 4 + 3m + 6 \\ &= -m^2 - m + 2 \end{aligned}$$

20.) If $c(x) = 2x^2 - 6x - 11$, find $c(t-3)$.

$$\begin{aligned} c(t-3) &= 2(t-3)^2 - 6(t-3) - 11 \\ &= 2(t-3)(t-3) - 6(t-3) - 11 \\ &= 2(t^2 - 6t + 9) - 6(t-3) - 11 \\ &= 2t^2 - 12t + 18 - 6t + 18 - 11 \\ &= 2t^2 - 18t + 25 \end{aligned}$$

Review.

21.) Simplify. $\frac{2}{3} + 3\left(2 - \frac{1}{4}\right) - 2$

$$\begin{aligned} &= \frac{2}{3} + 3\left(\frac{8}{4} - \frac{1}{4}\right) - 2 \\ &= \frac{2}{3} + 3\left(\frac{7}{4}\right) - 2 \\ &= \frac{2}{3} + \frac{21}{4} - 2 \\ &= \frac{8}{12} + \frac{63}{12} - \frac{24}{12} \end{aligned}$$

$$= \frac{47}{12}$$

22.) Factor. $4x^2 - 16x + 9$

PRIME

~~36~~
~~-16~~

23.) Solve. $\frac{5 - 3(m-4)^2}{-5} = \frac{41}{-5}$

$$\frac{-3(m-4)^2}{-3} = \frac{36}{-3}$$

$$(m-4)^2 = -12$$

$$m-4 = \pm \sqrt{-12}$$

$$m-4 = \pm 2i\sqrt{3}$$

$$m = 4 \pm 2i\sqrt{3}$$

24.) Given $(-3, 2)$ & $(6, 5)$ lie on a line write an equation in slope-intercept form.

$$m = \frac{5-2}{6-(-3)} = \frac{3}{9} = \frac{1}{3}$$

$$y = mx + b$$

$$5 = \left(\frac{1}{3}\right)(6) + b$$

$$5 = 2 + b$$

$$3 = b$$

$$y = \frac{1}{3}x + 3$$

or $y - y_1 = m(x - x_1)$

$$y - 5 = \frac{1}{3}(x - 6)$$

$$y - 5 = \frac{1}{3}x - 2$$

$$y = \frac{1}{3}x + 3$$