

Secondary 2 Honors Unit 3 Review

Show your work and answer the questions completely. Simplify your answers completely. Credit may not be given for an answer alone.

Use the properties of exponents to evaluate or simplify the expression.

1)  $3b^5 \cdot 7b^3 = 21b^8$

2)  $\left(\frac{x^7 y^2}{z^4}\right)^3 = \frac{x^{21} y^6}{z^{12}}$

3)  $\left(7\frac{14}{7}\right)^{\frac{2}{7}} = 7^{\frac{28}{14}} = 7^2 = 49$

4)  $\frac{(-u^{-3}v^3)^2}{(u^3v)^{-3}} = \frac{u^{-6}v^6}{u^{-9}v^{-3}} = u^3 v^9$

5)  $\frac{9a^2 b^7 c^3}{2a^5 b^4 c^5} = \frac{9b^3}{2a^3 c^2}$

6)  $\left(\frac{1}{2}w^3\right)^2 (w^4)^2 = \frac{1}{4}w^6 w^8 = \frac{1}{4}w^{14}$

7)  $\left(\frac{3x^3 y^{17} z}{12a^{115} b}\right)^5 = 1$

8)  $\frac{a^{\frac{5}{2}}}{a^{\frac{1}{3}}} = a^{\frac{15}{6} - \frac{2}{6}} = a^{\frac{13}{6}}$

9)  $3^{\frac{3}{7}} \cdot 3^{\frac{1}{2}} = 3^{\frac{14}{14} + \frac{7}{14}} = 3^{\frac{21}{14}} = 3^{\frac{3}{2}}$

10)  $\sqrt[3]{-81} = -3\sqrt[3]{3}$

11)  $9^{\frac{3}{2}} = (\sqrt{9})^3 = 3^3 = 27$

12)  $16^{\frac{3}{4}} = (\sqrt[4]{16})^3 = 2^3 = 8$

13)  $\sqrt{72x^5 y^6} = 6x^2 y^3 \sqrt{2x}$

14)  $\sqrt[4]{64n^9 m^8} = 2n^2 m^2 \sqrt{4n}$

15)  $\sqrt[3]{54x^5 y^2} = 3x \sqrt{2x^2 y^2}$

16)  $x^{4/5} \cdot \sqrt[4]{x} = x^{4/5} \cdot x^{1/4} = x^{\frac{16}{20} + \frac{5}{20}} = x^{21/20}$

17)  $\frac{14x^{1/3}}{7x^2} = 2x^{\frac{1}{3} - 2} = \frac{2}{x^{5/3}}$

Solve the following equations.

18)  $\sqrt{8x-4} - 2 = 4$   
 $\sqrt{8x-4} = 6$   
 $8x-4 = 36$   
 $8x = 40$   
 $x = 5$

19)  $2x^3 + 5 = 59$   
 $2x^3 = 54$   
 $x^3 = 27$   
 $x = 3$

20)  $((x-5)^{1/3})^3 = (3)^3$   
 $x-5 = 27$   
 $x = 32$

21)  $(y^{1/4}) = (5)^4$   
 $y = 625$

22)  $((m-2)^{3/2})^{2/3} = (27)^{2/3}$   
 $m-2 = 9$   
 $m = 11$

Simplify the following complex expressions. Make sure your answer is in standard form.

23)  $(9 + 10i) + (+6 + 4i)$

$15 + 6i$

24)  $(7 + 8i) + (4 - 2i)$

$11 + 6i$

25)  $6i(4 + 3i)$

$24i + 18i^2$   
 $+ 18 + 24i$

26)  $(5 - 2i)(4 + i)$

$20 + 5i - 8i - 2i^2$   
 $22 - 3i$

27)  $(3 + 4i)(3 - 4i)$

$9 - 12i + 12i - 16i^2$   
 $9 + 16$   
 $= 25$

28)  $(1 + 2i)^2$

$(1 + 2i)(1 + 2i)$   
 $1 + 2i + 2i + 4i^2$   
 $- 3 + 4i$

Given the following functions, perform the indicated operation and simplify.

$f(x) = x^2 + 1$

$g(x) = x + 3$

$h(x) = x^2 - 2x + 4$

$j(x) = 3 - i$

$k(x) = -7x^{1/3}$

$m(x) = -3 - 6i$

$n(x) = 12x^{1/3}$

$p(x) = x^{1/4}$

$q(x) = \sqrt[3]{x}$

$r(x) = 8\sqrt[3]{x^2}$

$t(x) = -3 + 6i$

$v(x) = 2 - 6i$

29)  $(q \cdot r)(x) = \sqrt[3]{x} \cdot 8\sqrt[3]{x^2}$

$8\sqrt[3]{x^3}$

$8x$

~~30)  $j(m(x))$~~

31)  $(t + v)(x) = -3 + 6i + 2 - 6i$

$-1 + 0i$

$-1$

32)  $k(x) + n(x) = -7x^{1/3} + 12x^{1/3}$

$= 5x^{1/3}$

Use the following functions for the following set of problems:

$f(x) = -3x + 5$

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

$h(x) = x - 2$

Evaluate or simplify each function:

33)  $f(-2)$

$f(-2) = -3(-2) + 5$   
 $= 6 + 5$   
 $= 11$

34)  $g(-3)$

$g(-3) = -3^2 - 1$   
 $= 9 - 1$   
 $= 8$

35)  $(f + h)(x)$

$= -3x + 5 + x - 2$   
 $= -2x + 3$

36)  $(h \cdot f)(x)$

$(x - 2)(-3x + 5)$   
 $-3x^2 + 5x + 6x - 10$   
 $= -3x^2 + 11x - 10$

37)  $(g - f)(2)$

$(2)^2 - 1 - (-3(2) + 5)$   
 $4 - 1 - (-6 + 5)$   
 $3 + 6 - 5$   
 $= 4$

38)  $(g + h)(x)$

$x^2 - 1 + x - 2$   
 $= x^2 + x - 3$

39)  $(g - f)(2)$

same as  
37

40)  $(g + h)(x)$

same as  
38

41)  $3 \cdot h(x)$

$= 3(x - 2)$   
 $= 3x - 6$