Name: Key Date:

Radicals and Rational Exponents Test Review

Simplify. Leave all answers in radical form.

1.) $\sqrt[3]{128a^{18}b} = \sqrt[3]{64 \cdot 2 \cdot a^{18} b}$

$= \boxed{4a^6 \sqrt[3]{2b}}$

2.) $\sqrt{3}(\sqrt{3} - 4\sqrt{12}) + \sqrt{40} = \sqrt{9} - 4\sqrt{36} + \sqrt{4 \cdot 10}$

$3 - 4(6) + 2\sqrt{10}$

$\boxed{-21 + 2\sqrt{10}}$

FOIL

3.) $(\sqrt{10} + \sqrt{5})^2 = (\sqrt{10} + \sqrt{5})(\sqrt{10} + \sqrt{6})$

$\sqrt{100} + \sqrt{50} + \sqrt{50} + \sqrt{25}$

$10 + 5\sqrt{2} + 5\sqrt{2} + 5$

$\boxed{15 + 10\sqrt{2}}$

4.) $\dfrac{\sqrt[3]{p^3q^{12}}}{\sqrt[3]{q^2}} = \sqrt[3]{p^3q^{10}} = \sqrt[3]{p^3 \cdot q^9 \cdot q}$

$= \boxed{pq^3\sqrt[3]{q}}$

5.) $\dfrac{3}{2+\sqrt{5}} \cdot \dfrac{(2-\sqrt{5})}{(2-\sqrt{5})}$

$= \dfrac{6 - 3\sqrt{5}}{4 - \sqrt{25}} = \dfrac{6 - 3\sqrt{5}}{-1} = \boxed{-6 + 3\sqrt{5}}$

5

6.) $\dfrac{\sqrt{9m^2}}{\sqrt{3m}} = \sqrt{3m}$

7.) $(y^2)^{\frac{2}{4}}$

$y^{4/4} = \boxed{y}$

8.) $\dfrac{p^{\frac{7}{3}}}{p^{\frac{1}{3}}} = p^{7/3 - 1/3} = p^{6/3} = \boxed{p^2}$

9.) $\dfrac{\sqrt{c^5}}{\sqrt[4]{c^7}} = \dfrac{c^{5/2}}{c^{7/4}}$

$5/2 - 7/4$

$\dfrac{10}{4} - \dfrac{7}{4} = \dfrac{3}{4} \rightarrow c^{3/4} = \boxed{\sqrt[4]{c^3}}$

10.) $16^{\frac{1}{4}} \cdot 16^{\frac{3}{4}} = 16^{\frac{1}{4} + \frac{3}{4}} = 16^{\frac{4}{4}}$

$= 16^1 = \boxed{16}$

Solve Each Equation

11.) $\sqrt{m-7}+9=10$

$\sqrt{m-7}^2 = 1^2$

$m-7=1$

$\boxed{m=8}$

ck

$\sqrt{8-7}+9=10$

$1+9=10$

$10=10$ ✓

12.) $\left[(41k-31)^{\frac{1}{4}}\right]^4=(5)^4$

$41k-31=625$

$41k=656$

$\boxed{k=16}$

ck

$(41(16)-31)^{1/4}=5$

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

$5=5$ ✓

13.) $(\sqrt{12-n})^2=n^2$

$12-n=n^2$

$0=n^2+n-12$

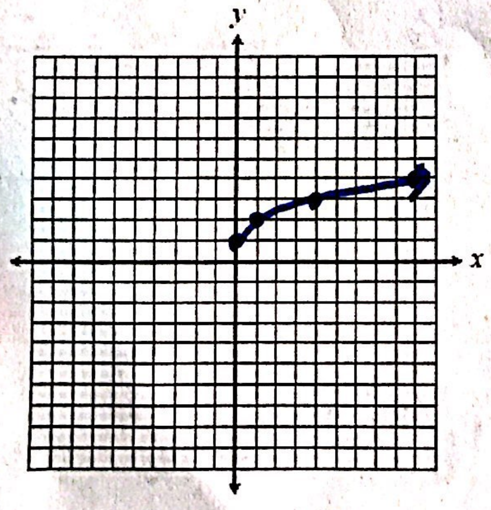
$0=(n+4)(n-3)$

$n+4=0$ | $n-3=0$

$n=-4$ | $n=3$

Graph the function and identify the key characteristics.

14.) $f(x)=\sqrt{x}+1$ $(h,k)\rightarrow(0,1)$



x	y
0	1
1	2
4	3
9	4

D: $[0,\infty)$ R: $[1,\infty)$

Endpoint/Turning Point: $(0,1)$

End Behavior:

As $x\rightarrow$ ∞, $f(x)\rightarrow$ ∞

As $x\rightarrow$ 0, $f(x)\rightarrow$ 1

Increasing Interval(s): $[0,\infty)$

Decreasing Interval(s): —