LESSON 171

1. $\sqrt{24}=\sqrt{4\cdot 6}=\sqrt{4}\cdot\sqrt{6}=2\sqrt{6}$

2. $\sqrt{\dfrac{27}{x^4}}=\dfrac{\sqrt{27}}{\sqrt{x^4}}=\dfrac{\sqrt{9\cdot 3}}{\sqrt{(x^2)^2}}=\dfrac{\sqrt{9}\cdot\sqrt{3}}{x^2}=\dfrac{3\sqrt{3}}{x^2}$

3. The answer is C.
   $2=\sqrt{4}=\sqrt[3]{8}=\sqrt[4]{16}=\sqrt[5]{32}=\sqrt[6]{64}$

4. $\sqrt[4]{\dfrac{x^5}{81}}=\dfrac{\sqrt[4]{x^5}}{\sqrt[4]{81}}=\dfrac{\sqrt[4]{x^4\cdot x}}{3}=\dfrac{\sqrt[4]{x^4}\cdot\sqrt[4]{x}}{3}=\dfrac{x\sqrt[4]{x}}{3}$

5. $\sqrt{20}+2\sqrt{45}-3\sqrt{5}=2\sqrt{5}+6\sqrt{5}-3\sqrt{5}=5\sqrt{5}$

6. $\sqrt{3}(\sqrt{6}-\sqrt{27})+2\sqrt{18}$
   $=\sqrt{18}-\sqrt{81}+2\sqrt{18}=-9+3\sqrt{18}=-9+9\sqrt{2}$
   $a/b=(-9)/9=-1$

7. $\dfrac{1}{2+\sqrt{3}}=\dfrac{1}{2+\sqrt{3}}\cdot\dfrac{2-\sqrt{3}}{2-\sqrt{3}}=\dfrac{2-\sqrt{3}}{4-3}=2-\sqrt{3}$
   $ab=2(-1)=-2$

8. The answer is B.
   A) $8^{2/3}=(2^3)^{2/3}=2^2=4$
   B) $27^{2/3}=(3^3)^{2/3}=3^2=9$
   C) $25^{1/2}=(5^2)^{1/2}=5$
   D) $32^{3/5}=(2^5)^{3/5}=2^3=8$

9. $x^{1/5}(x^{2/5})^{3/2}=x^{1/5}\cdot x^{3/5}=x^{4/5}=\sqrt[5]{x^4}$
   $m-n=5-4=1$

10. $8-\sqrt{2x+3}=5$
   $\sqrt{2x+3}=3$ Isolate the radical.
   $2x+3=9$ Square both sides.
   $x=3$ Sove for x.

11. $x+1=\sqrt{3x+1}$
   $(x+1)^2=3x+1$ Square both sides.
   $x^2-x=0$ Standard form
   $x(x-1)=0$ Sove for x.
   $x=0, x=1$

12. $\sqrt{x+2}=1+\sqrt{3-x}$ Isolate one radical.
   $(\sqrt{x+2})^2=(1+\sqrt{3-x})^2$ Square both sides.
   $x+2=1+2\sqrt{3-x}+3-x$ Simplify.
   $\sqrt{3-x}=x-1$ Isolate the radical.
   $3-x=(x-1)^2$ Square both sides.
   $x^2-x-2=0$ Sove for x.
   $(x+1)(x-2)=0$
   $x=-1, x=2$
   $x=-1$ is extraneous, so the solution is $x=2$.

13. $x^{3/4}=27$
   $(x^{3/4})^{4/3}=27^{4/3}$ Raise to the reciprocal power. Then simplify.
   $x=27^{4/3}=(3^3)^{4/3}$
   $x=3^4=81$

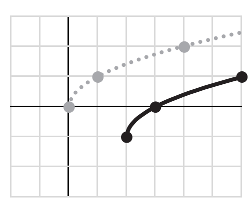
14. $(x^2-1)^{1/3}=2$
   $[(x^2-1)^{1/3}]^3=2^3$ Cube both sides.
   $x^2-1=8$ Simplify.
   $x^2=9$ Sove for x.
   $x=3, x=-3$
   $mn=3(-3)=-9$

15. The answer is B.
   $f(x)$ is $y=\sqrt{x}$ reflected over the y-axis.

16. The answer is C.
   The graph involves a reflection of $y=\sqrt{x}$ over the x-axis, so eliminate A and B.
   $(0,1)$ is on the graph, so choose C.

17. The answers are B and C.
   The graph involves a reflection of $y=\sqrt[3]{x}$ over either the x- or y-axis, so eliminate A.
   The graph involves a vertical shift, so eliminate D.
   B and C have the same shape because $\sqrt[3]{-x}=-\sqrt[3]{x}$.

18. The answers are A, C, and D.



Sketch the graph. $f(x)$ is $y=\sqrt{x}$ shifted right 2 units and down 1 unit.
B) The range is $[-1, \infty)$.

19. The width, height, and diagonal form a right triangle.
   Let $x=$ height of the monitor.
   By The Pythagorean Theorem, $12^2+x^2=15^2$.
   Solve for x, and you get $x=9$.
   The height is 9 inches.

20. $\sqrt{(k-1)^2+(1-3)^2}=\sqrt{13}$

$(k-1)^2+(1-3)^2=13$ Square both sides.

$k^2-2k-8=0$ Standard form

$(k+2)(k-4)=0$ Solve for k.

$k=-2, k=4$

$k>0$, so $k=4$.