## Unit 3 Lesson 8: Cubes and Cube Roots

### 1 Put Your Arm(s) Up (Warm up)

#### Student Task Statement

How are these graphs the same? How are they different?





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### 2 Finding Cube Roots with a Graph

#### Student Task Statement

How many solutions are there to each of the following equations? Estimate the solution(s) from the graph of $y=x^{3}$. Check your estimate by substituting it back into the equation.

1. $x^{3}=8$
2. $x^{3}=2$
3. $x^{3}=0$
4. $x^{3}=-8$
5. $x^{3}=-2$



### 3 Cube Root Equations (Optional)

#### Student Task Statement



1. Use the graph of $y=\sqrt[3]{x}$ to estimate the solution(s) to $\sqrt[3]{x}=-4$.
2. Use the meaning of cube roots to find an exact solution to the equation $\sqrt[3]{x}=-4$. How close was your estimate?
3. Find the solution of the equation $\sqrt[3]{x}=3.5$ using the meaning of cube roots. Use the graph to check that your solution is reasonable.

### 4 Solve These Equations With Cube Roots in Them

#### Student Task Statement

Here are a lot of equations:

* $\sqrt[3]{t+4}=3$
* $-10=-\sqrt[3]{a}$
* $\sqrt[3]{3−w}−4=0$
* $\sqrt[3]{z}+9=0$
* $\sqrt[3]{r^{3}−19}=2$
* $5−\sqrt[3]{k+1}=-1$
* $\sqrt[3]{p+4}−2=1$
* $6−\sqrt[3]{b}=0$
* $\sqrt[3]{2n}+3=-5$
* $4+\sqrt[3]{-m}+4=6$
* $-\sqrt[3]{c}=5$
* $\sqrt[3]{s−7}+3=0$
1. Without solving, identify 3 equations that you think would be the least difficult to solve and 3 equations that you think would be the most difficult to solve. Be prepared to explain your reasoning.
2. Choose 4 equations and solve them. At least one should be from your “least difficult” list and at least one should be from your “most difficult” list.



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