Algebra 1
Unit 7 Practice Assessment

Name

Targets 7.1, 7.3, 7.4

Determine whether each equation is *True* or *False*. If it is true, show your work to defend your answer. If it is false, show your work and explain why it is false. Use properties of exponents in your work.

1. $\sqrt{64} = 8^{\frac{3}{2}}$ false

$(64)^{\frac{1}{2}} = (8)^{3/2}$

$(8^2)^{\frac{1}{2}} = (8)^{3/2}$

$8^1 \neq 8^{3/2}$

2. $25^{\frac{5}{2}} = 5^2 \cdot 5^3$ true

$(5^2)^{\frac{5}{2}} = 5^{2+3}$

$5^5 = 5^5$ ✓

3. $4^{-2} = \left(\frac{1}{2}\right)^{-4}$ false

$(2^2)^{-2} = (2^{-1})^{-4}$

$2^{-4} \neq 2^4$

4. $2^4 = (\sqrt[3]{8})^6$ false

$2^4 = (8)^{6/3}$

$2^4 = (2^3)^2$

$2^4 \neq 2^6$

5. Circle the expressions that are equivalent to 16. **Show your work using properties of exponents.**

$(\sqrt{4})^4$

$= (4^{\frac{1}{2}})^4$

$= 4^2$

$= 16$

~~$\sqrt{2^2}$~~

$= 2^{2/2}$

$= 2^1$

$\sqrt{2^8}$

$= 2^{8/2}$

$= 2^4$

$= 16$

$\left(4^{\frac{1}{3}}\right)^6$

$= 4^{6/3}$

4^2

$= 16$

Targets 7.1, 7.3, 7.4

6. Here are two problems that were worked out by students. However, the students made mistakes in their work. Identify the mistake (by circling it or explaining it). Then correct the mistake next to each problem below. Simplify your answer.

$\frac{a^3 b^2}{a^{-3}} = a^0 b^2 = b^2$ $\quad a^{3--3} b^2 = a^6 b^2$

$\frac{x^5 y^4}{x^{-3} y^{-4}} = x^2 y^0 = x^2$ $\quad x^{5--3} y^{4--4} = x^8 y^8$

Target #1: use properties of exponents
Target #2: explain the meaning of a rational exponent
Target #3: apply properties of exponents to explain the meaning of rational exponents
Target #4: convert back-and-forth from radical form to rational exponent form
Target #5: graph piece-wise functions
Target #6: graph absolute value functions
Target #7: graph step functions
Target #8: graph square root functions
Target #9: graph cube root functions

Target 7.5

7. The PLex theatre charges admission to groups according to the following policy. Groups of 15 or more people are charged a rate of $4.00 per person, while groups with less than 15 are charged a rate of $6 per person.

   a) Sketch the graph of the function.

   b) How much money will a group of 13 people save in admission cost if it can recruit two additional members?

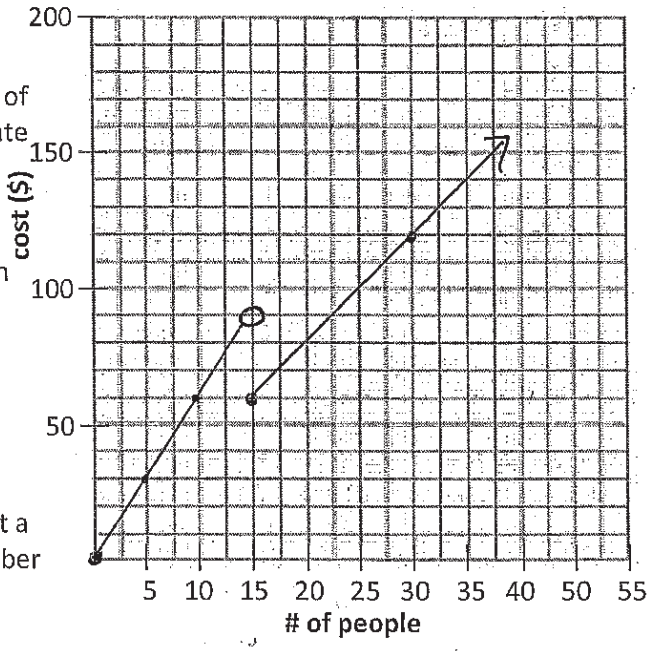
   (13)(6) = $78

   (15)(4) = $60

   save $18

   c) BONUS: Write a mathematical model expressing the amount a group will be charged for admission as a function of the number of people in the group.
   Let C(x) = cost and x = number of people.

$$C(x) = \begin{cases} 6x, & x < 15 \\ 4x, & x \geq 15 \end{cases}$$

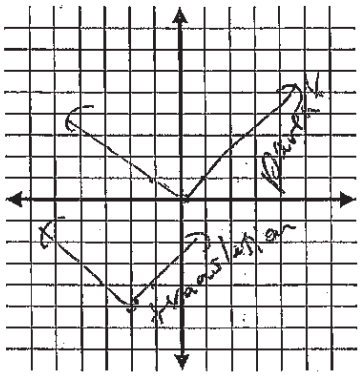


Target 7.6

8. a) Graph the parent function y = |x|. Then graph y = |x+2| - 5. Label each graph.

   b) Explain how you graphed y = |x+2| - 5 using translations.

   left 2
   down 5



Targets 7.8, 7.9

9. Match the following graphs with their equations. Write the letter of the equation in the box next to the graph.

   A. $y = \sqrt[3]{x-2} + 2$ right 2 up 2

   B. $y = \sqrt[3]{x+2} + 2$ left 2 up 2

   C. $y = \sqrt{x+2} + 2$ left 2 up 2

   D. $y = \sqrt{x-2} + 2$ right 2 up 2