CONCEPT TO CONSTRUCTION

Rubric and Sample Responses

Question 1

RUBRIC

Score	Description
3	Student response shows a thorough understanding of scale drawing and ratios • Student correctly identifies that the floor plan does not fit the foundation (1 point). • Student thoroughly explains or shows how find the answer (2 points).

SAMPLE RESPONSE

The client's floor plan will not fit the foundation. The foundation is 68 by 48 feet. Since 1 square = 3 feet, and the drawing is 20 squares by 16 squares, the house size is 60 feet by 48 feet, not 68 feet by 48 feet.

Question 2

RUBRIC

Score	Description
10	Student response shows a thorough understanding of scale drawing and ratios. • Student correctly draws a floor plan to scale. (6 points) • All measurements are realistic. (2 points) • All areas are correct. (2 points)

SAMPLE RESPONSE

Student answers will vary. For example correct answers see Client C House Drawing Example Alternative 2 x 2.

Question 3

RUBRIC

Score	Description
8	Student response shows a thorough understanding of scale drawing and ratios. • Student correctly draws a floor plan to scale. (6 points) • All areas are correct. (2 points)

SAMPLE RESPONSE

Student answers will vary and should reflect the initial house drawing submitted for individual work. For example correct answers see Client C House Drawing Example Alternative.

Question 4

RUBRIC

Score	Description
4	Student response shows a thorough understanding of equations and proportionality. • Student correctly writes an equation for construction worker pay. (2 points) • Student explains the development of the equation. (2 points)

SAMPLE RESPONSE

y = 7.50x

The rate per square foot is constant at $7.50, so all you need to do is multiply the number of hours by $7.50 to get the total cost.

Question 5

RUBRIC

Score	Description
4	Student response shows a thorough understanding of equations and proportionality. • Student correctly calculates the proportional relationship between costs (1 point each). • Student correctly identifies the plumber whose costs are proportional to the number of hour worked and clearly explains the reasons. (2 points)

SAMPLE RESPONSE

a. $\frac{940}{790} = \frac{94}{79}$

b. $\frac{600}{940} = \frac{60}{94} = \frac{30}{47}$

c. Plumber 1 charges a fee proportional to the number of hours he works. I know because all the ratios of hours worked to cost are the same for all points. Also, the graph goes through the origin; there is no cost for no hours worked.

Question 6

RUBRIC

Score	Description
4	Student response shows a thorough understanding of equations and proportionality. • Student correctly calculates the proportional relationship between costs. (2 points each) • Student correctly explains why the granite price is proportional. (2 points)

SAMPLE RESPONSE

a. $\frac{6000}{100} = \frac{x}{1}$

$6000 = 100x

x =$60

b. $\frac{2400}{40} = \frac{x}{1}$

$2400 = 40x

x = $60

c. Price per square foot is $60, no matter how many feet you buy. If you divide the cost by the number of feet, you always get $60.

Question 7

RUBRIC

Score	Description
6	Student response shows a thorough understanding of unit rates. • Student uses proportions correctly to find the unit rate for each situation. (2 point each) • Student explains the answer. (2 points)

SAMPLE RESPONSES

Fixture World:

$$\frac{3 fixtures}{249} = \frac{1 fixture}{x}$$

3x = $249

x = $\frac{249}{3}$ = $83

OR

$$\frac{1 fixture}{3 fixtures} = \frac{x}{249}$$

3x = $249

x = $\frac{249}{3}$ = $83

Land of Fixtures:

$$\frac{4 fixtures}{324} = \frac{1 fixture}{x}$$

4x = $324

x = $\frac{324}{4}$ = $81

OR

$$\frac{1 fixture}{4 fixtures} = \frac{x}{324}$$

4x = $324

x = $\frac{324}{4}$ = $81

I disagree with the client. The per fixture cost from Land of Fixtures is $81, versus $83 at Fixture World. Therefore, it is cheaper to purchase 4 fixtures at $324.

Question 8

RUBRIC

Score	Description
3	Student response shows a thorough understanding of proportions. • Student finds the correct answer. (1 point) • Student clearly explains or shows how to find the answer. (2 points).

SAMPLE RESPONSE

1/2 fixture ÷ 1/3 hour = *x* fixtures ÷ 1 hour

x = 3/2 fixtures ÷ hour

4 fixtures ÷ (3/2 fixtures ÷ hour) = $\frac{8}{3}$ hours = $2\frac{2}{3}$hours

Question 9

RUBRIC

Score	Description
5	Student response shows a thorough understanding of unit rates. • Part a is scored by the computer. (1 point for each correct unit rate. • Student correctly answers part b with a clear explanation. (2 points) Student correctly calculates the cost of 40 handles and clearly shows or explains how to find the answer. (2 points)

SAMPLE RESPONSES

a.

Quantity of Handles	Total Price	Price per Handle
1	$3.25	$3.25
5	$16.25	$3.25
10	$32.00	$3.20
15	$48.00	$3.15
20	$63.00	$3.15
25	$78.75	$3.15

b.

No, the price per handle is not proportional for every quantity. The cost for one handle is different, depending on the number of handles that you buy.

c.

$\frac{15handles}{48.00} = \frac{40handles}{x}$ OR $\frac{15handles}{40handles} = \frac{48.00}{x}$

15x = (40)(48.00) = $1920

x = $\frac{1920}{50}$ = $128 for 40 handles

Question 10

RUBRIC

Score	Description
5	Student response shows a thorough understanding of unit rates. • Student correctly finds the sale price of the refrigerator. (1point) • Student correctly finds the tax on the refrigerator and provides the total cost. (1 point) • Student clearly shows or explains how to find the sale price and sales tax. (2 points). • Student correctly finds the total cost as a percentage of the original price. (1 point)

SAMPLE RESPONSE

Part a.

Price with 20% discount:

$\frac{80\%}{100\%} = \frac{x}{1399.99}$ OR $\frac{1399.99}{100\%} = \frac{x}{80\%}$

(100%)x = (80%)(1399.99) = (.80)(1399.99) = $1119.99

The new price with the discount is $1119.99

Price with 5% sales tax:

$\frac{105\%}{100\%} = \frac{x}{1119.99}$ OR $\frac{1119.99}{100\%} = \frac{x}{105\%}$

(100%)x = (105%)(1119.99) = (1.05)(1119.99) = $1175.99

First, I knew that the discount was 20%, so I would pay 80%. Using a proportion, I found 80% of $1399.99. Then I knew that I'd pay 100% of that price and a 5% tax, together 105% of the price. Using a proportion, I found the total price after tax to be $1175.99.

Part b.

$\frac{1175.99}{1399.99} = \frac{x}{100\%}$ OR $\frac{1399.99}{100\%} = \frac{1175.99}{x}$

(1399.99)x = (100%)(1175.99) = $\frac{(1)(1175.99)}{1399.99}$ = .84 or 84%

Question 11

RUBRIC

Score	Description
4	Student response shows a thorough understanding of unit rates. • Student correctly finds the increased price of the dishwasher. (1point) • Student correctly finds the tax on the tax on the purchase and provides the total cost. (1 point) • Student clearly shows or explains how to find the increased price and sales tax. (2 points).

SAMPLE RESPONSE

New Price of dishwasher:

$\frac{107.5\%}{100\%} = \frac{x}{475}$ OR $\frac{475}{100\%} = \frac{x}{107.5\%}$

100%x = (107.5%)(475) = (1.075)(475) = $510.63

New Price with tax:

$\frac{105\%}{100\%} = \frac{x}{510.63}$ OR $\frac{510.63}{100\%} = \frac{x}{105\%}$

100%x = (105%)($510.63) = (1.05)(510.63) = $536.16

First, I knew that the markup was 7.5%, so I would pay 107.5%. Using a proportion, I found 107.5% of $475.00. Then I knew that I'd pay 100% of that price and a 5% tax, together 105% of the price. Using a proportion, I found the total price after tax to be $536.16.