Unit 2: Quiz 2 Take Home and Check
Direct Variation
Calculators allowed!

Name _____

1) Use the table to show if x and y show a direct variation.

x	−5	−1	1	2	3
y	−15	−3	3	6	9

B
C

1) $\dfrac{y}{x}$ $\dfrac{-15}{-5}$ $\dfrac{-3}{-1}$ $\dfrac{3}{1}$ $\dfrac{6}{2}$ $\dfrac{9}{3}$

↓ ↓ ↓ ↓ ↓

3 3 3 3 3 → unit rates the same

Yes!

2) Use the table to show if x and y show a direct variation.

x	0	3	5	6	7
y	0	12	20	24	28

A

2) $\dfrac{y}{x}$ $\dfrac{0}{0}$ $\dfrac{12}{3}$ $\dfrac{20}{5}$ $\dfrac{24}{6}$ $\dfrac{28}{7}$

↓ ↓ ↓ ↓

4 4 4 4

$\dfrac{0}{0}$ means yes!!

3) Use the table to show if x and y show a direct variation.

x	1	2	4	7	9
y	3	4	6	9	11

A
B
C

3) $\dfrac{y}{x}$ $\dfrac{3}{1}$ $\dfrac{4}{2}$ $\dfrac{6}{4}$ $\dfrac{9}{7}$ $\dfrac{11}{9}$

↓ ↓

3 2

unit rates are diff   No!

4) Use the table to show if x and y show a direct variation.

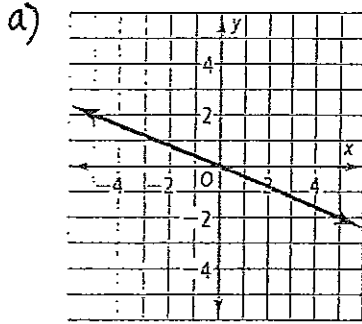| x	4	7	9	12	13
y	6	12	16	22	24

A
B
C

4) $\dfrac{y}{x}$ $\dfrac{6}{4}$ $\dfrac{12}{7}$ $\dfrac{16}{9}$ $\dfrac{22}{12}$ $\dfrac{24}{13}$
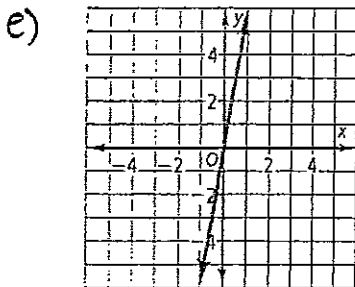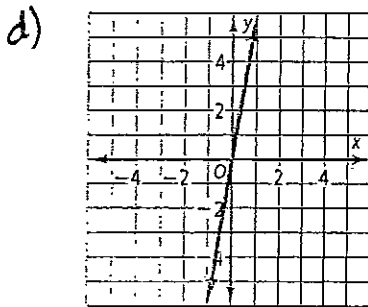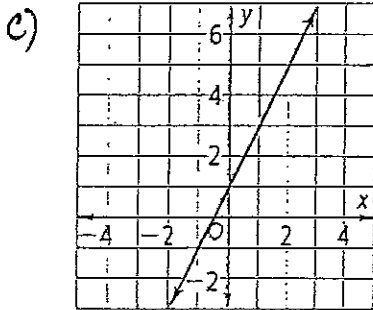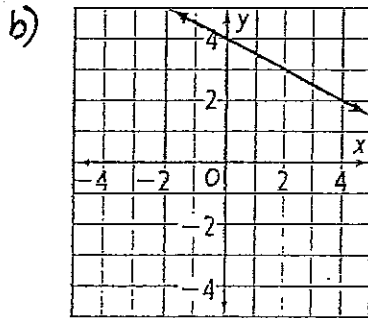
↓ ↓ ↓ ↓ ↓

1.5 1.7 1.7 1.8 1.8

unit rates are diff so NO!

5) Put an X next to the graphs that show a direct variation.

a)

A
B
C

b)

c)

d)

e)

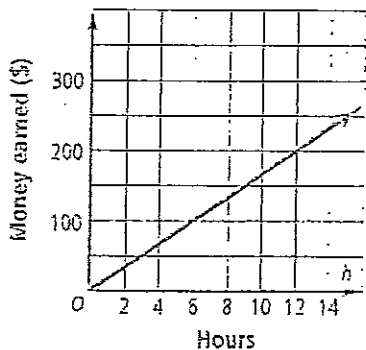5) Graphs that show a direct Variation:

$$a, d, e$$

- Straight line
- passes through origin $(0,0)$

(6) The graph below is about Janine's job.

a) How much does Janine make if she works for 6 hours?

b) What does the point (0,0) represent?

c) What does the point (12, 200) represent?

d) How much does Janine make in 1 hr?

Money earned ($) vs Hours

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(6)

a) $100

b) at 0 hours, no money earned

c) At 12 hours Janine will make $200

d) unit rate =

$$\frac{100}{6} = \$16.67 \,/hr.$$

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7) Fill in the blanks:

a) From a table, I know that there is a proportional relationship because

_____

b) From a graph, I know that there is a proportional relationship because

_____

c) From a group of ordered pairs, I know that there is a proportional relationship because

_____

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7)

a) all of the unit rates are the same.

b) the line is straight and passes through the origin.

c) $\frac{\Delta Y}{\Delta X}$ is the same for all pairs.

d) there is no y intercept

$$y = 3x \boxed{-5}$$

↗ y-intercept

d) From looking at an equation, I know that there is a proportional relationship because

_____

_____ .

(See previous page)

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8) Aaron earns $48 for a 6 hour shift at Moe's. The amount of money he earns varies directly to the number of hours worked. Find the constant, k, and write an equation for this relationship. Then find the amount of money he will earn Saturday for a 10 hour shift.

A
B
C

8)

hrs	money
0	0
6	$48
10	

$$K = \frac{y}{x}$$

$$K = \frac{48}{6} = 8$$

$$\boxed{y = 8x}$$

if $x = 10$ then $y = 8(10)$

$$\boxed{y = \$80}$$

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9) The Toyota Prius can travel 288 miles on eight gallons of gas. How much gas will the Prius require to travel 594 miles? Make an equation to show a proportional relationship, then solve.
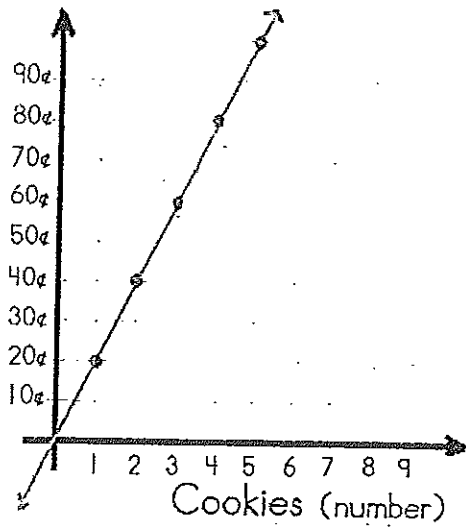
A
B
C

$$\frac{8g}{288m} = \frac{x}{594m}$$

$$\frac{288x}{288} = \frac{4752}{288}$$

$$\boxed{x = 16.5 \text{ gallons}}$$

90¢
80¢
70¢
60¢
50¢
40¢
30¢
20¢
10¢

1 2 3 4 5 6 7 8 9
Cookies (number)

10) Give 3 more ordered pairs that would be on the line on this graph.

10)

cookies	price	
1	20	(1, 20)
2	40	(2, 40)
3	60	(3, 60)
4	80	(4, 80)
5	100	(5, 100)
6	120	(6, 120)
7	140	(7, 140)
8	160	(8, 160)

11) A submarine dives 300 feet every 2 minutes, and 6750 feet every 45 minutes. Let x represent the time of the dive. Let y represent the depth of the submarine. Write an equation for the proportional relationship using the rate in feet per minute.

11)

time	depth
2	300
45	6750

$$K = \frac{300}{2} = 150$$

$$y = 150X$$

12) Jared rents bowling shoes for $6 and pays $5 per bowling game. Is the relationship a proportional relationship? Explain.

B
C

12) No, equation to represent this would be $y = 5x + 6$ and therefore would not go through the origin.

13) If you know that a relationship is proportional and are given one ordered pair that is not (0,0), how can you find another pair?

B
C

13) Multiply both the x any y coordinate by the same constant.

ex: $(2,4)$ $(4,8)$ $(6,12)$

14) The graph shows the number of servings in different amounts of frozen yogurt listed on a carton. Write an equation that gives the number of servings y in x pints.

A
B
C

Frozen Yogurt
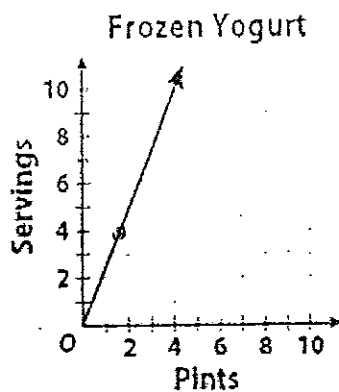
14) when $y = 4$, $x = 2$

$$K = \frac{y}{x}$$

$$K = \frac{4}{2}$$

$$K = 2$$

$$\boxed{y = 2x}$$

15) In the following table of values, x and y have a direct variation. Find the constant of variation and then use it to determine the missing value in the table.

A
B
C

x	y
6	12
8	16
9	?

15)

$$\frac{y}{x} \quad \frac{12}{6} \quad \frac{16}{8} \quad \frac{x}{9}$$
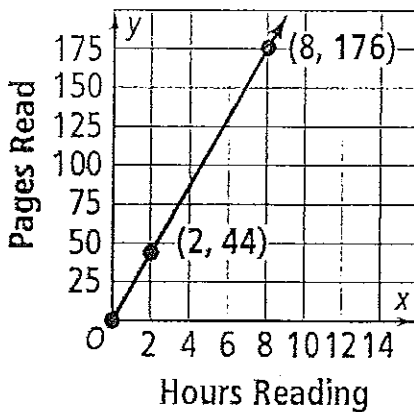
$$\quad\quad 2 \quad\quad 2$$

$$\frac{16}{8} = \frac{x}{9}$$

$$8x = 144$$

$$\boxed{x = 18}$$

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16) Shawn needs to read a book that is 374 pages long. The graph below shows his progress over the first 8 hours of reading. If he continues to read at the same rate, how many hours will it take for Shawn to read the entire book?

B
C

Pages Read vs. Hours Reading graph with points (2, 44) and (8, 176)

16)

$$\text{unit rate} = \frac{y}{x} \quad \frac{44}{2} = 22 \text{ pages/hr.}$$

$$\frac{22}{1} = \frac{374}{x}$$

$$\frac{22x}{22} = \frac{374}{22}$$

$$\boxed{x = 17 \text{ hrs}}$$

17) Circle the equations that show a direct variation.

a) $y = 2x - 9$

b) $y = -8x$

c) $y = -x + 7$

d) $y = 12x$

e) $y = \frac{3}{5}x$

A
B
C

17)

Equations with a direct Variation:

b, d, e

- no y intercept -

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18) Circle the ordered pairs that show a direct variation.

a) (2, 6), (3, 9), (4, 12)

b) (5, 1.25), (6, 1.5), (7, 1.75)

c) (1, 3), (2, 8), (3, 15)

d) (0, 0), (2, 5), (4, 10)

e) (4, 6), (5, 7.5), (6, 9)

f) (6, 15), (7, 10.5), (8, 20)

A
B
C

18)

Ordered pairs with a direct variation:

a) $(2,6)(3,9)(4,12)$ $\boxed{yes}$

$$\frac{\Delta y}{\Delta x} = \frac{9-6}{3-2} = \frac{3}{1}$$

$$= \frac{12-9}{4-3} = \frac{3}{1}$$

b) $(4,3)(5,1.25)(6,1.5)(7,1.75)$ $\boxed{yes}$

$$\frac{\Delta y}{\Delta x} = \frac{1.5-1.25}{6-5} = \frac{.25}{1}$$

$$= \frac{1.75-1.5}{7-6} = \frac{.25}{1}$$

c) $(1,3)(2,8)(3,15)$

$$\frac{\Delta y}{\Delta x} = \frac{8-3}{2-1} = \frac{5}{1} \boxed{NO}$$

$$= \frac{15-8}{3-2} = \frac{7}{1}$$

d) $(0,0)(2,5)(4,10)$

$\boxed{yes}$ $\frac{\Delta y}{\Delta x} = \frac{5-0}{2-0} = \frac{5}{2}$

$= \frac{10-5}{...}$

e) $(4,6)(5,7.5)(6,9)$

$$\frac{\Delta y}{\Delta x} = \frac{7.5-6}{5-4} = \frac{1.5}{1}$$

$\boxed{yes}$ $\frac{9-7.5}{6-5} = \frac{1.5}{1}$

f) $(6,15)(7,10.5)(8,20)$

$\frac{\Delta y}{\Delta x} = \frac{10.5-15}{7-6} = \frac{-4.5}{1}$ $\boxed{NO}$

$\frac{20-10.5}{...} = \frac{9.5}{...}$