DynaNotes Grade 8 Math Eligible TEKS Review & Intervention Program

Student Activity Book (includes 95 activities) – *Four Sample Answer Key Pages*

C2, One-Variable Equations and Inequalities

Skill Builder

Name _____ Date _____

Activity 12 – Writing Equations and Inequalities

Write a one-variable equation or inequality to represent each of the following situations or models.

1. Chris is twice the age of Mae. Grace is the same age as Chris. Grace is 9 years older than half of Mae's age. Represent the relationships between Chris' age and Grace's age in terms of Mae's age, m.

Chris' age = Grace's age

$2m = 9 + \frac{1}{2}m$

2. The area of a triangle is $3b + 2$ square feet, where b is the triangle's base. The triangle's height is 8 feet, and the area of any triangle is given by the formula $A = \frac{1}{2}bh$. Write an equation for this situation in terms of b.

area of the triangle = area of the triangle

$3b + 2 = \frac{1}{2}bh$

$3b + 2 = \frac{1}{2}b(8)$

3.

4		x	x	x
x	x	6		

What equation does this model represent?

first row = second row

$4 + x + x + x = x + x + 6$

$4 + 3x = 2x + 6$

4.

22		x	x	x
3	x			

41

What equation does this model represent?

first row – second row = 41

$22 + 3x - (3 + x) = 41$

$22 + 3x - 3 - x = 41$

$19 + 2x = 41$

5. In one month, Ms. Grant earned more money than Mr. Ling. Mr. Ling earned $25 per hour plus a $500 bonus for winning the sales contest. Ms. Grant worked the same number of hours and earned $28 per hour. Represent the relationship in terms of hours worked, h.

Ms. Grant's earnings > Mr. Ling's earnings

$28h > 25h + 500$

6. Pauli has at least as many books as Ricardo. Pauli has 3 times as many books as Darren. Ricardo has 12 fewer than 4 times as many books as Darren. Represent the relationship between the number of Pauli's books and the number of Ricardo's books in terms of the number of Darren's books, d.

Pauli's books ≥ Ricardo's books

$3d \geq 4d - 12$

7. A blue bag of dimes and quarters has less than half as much money as a red bag of dimes and quarters. The blue bag has 4 times as many dimes as quarters. The red bag has exactly 48 quarters and 28 dimes. Represent the relationship in terms of the number quarters in the blue bag, q.

value of blue bag < $\frac{1}{2}$(value of red bag)

$(q)(0.25) + (4q)(0.1) < \frac{1}{2}[(48)(0.25) + (28)(0.1)]$

$0.25q + 0.4q < \frac{1}{2}(12 + 2.8)$

$0.65q < \frac{1}{2}(14.8)$

$0.65q < 7.4$

8.

0.5	c	c
0.95		c

What inequality does this model represent?

$0.5 + 2c < 0.95 + c$

C2, Solving Simultaneous Linear Equations

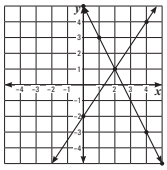
Skill Developer

Name _____ Date _____

Activity 21 – Identifying and Verifying Solutions to Simultaneous Linear Equations

For each graph, identify the x-value and y-value that simultaneously satisfy both linear equations. Next, verify whether or not the solution is correct mathematically. *Hint: Substitute the intersection's x-value into each equation and solve. The results should be the same y-value.*

1.



Equations: $y = 1.5x - 2$
$y = -2x + 5$

The solution's x-value appears to be 2.

The solution's y-value appears to be 1.

$y = 1.5x - 2$ | $y = -2x + 5$

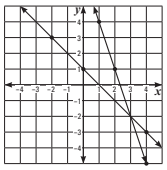
$y = 1.5(2) - 2$ | $y = -2(2) + 5$

$y = 3 - 2$ | $y = -4 + 5$

$y = 1$ | $y = 1$

Yes, (2, 1) is the solution to the simultaneous linear equations $y = 1.5x - 2$ and $y = -2x + 5$.

2.



Equations: $y = -3x + 7$
$y = -x + 1$

The solution's x-value appears to be 3.

The solution's y-value appears to be −2.

$y = -3x + 7$ | $y = -x + 1$

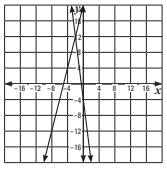
$y = -3(3) + 7$ | $y = -3 + 1$

$y = -9 + 7$ | $y = -2$

$y = -2$

Yes, (3, −2) is the solution to the simultaneous linear equations $y = -3x + 7$ and $y = -x + 1$.

3.



Equations: $y = -8x - 4$
$y = 4x + 20$

The solution's x-value appears to be −2.

The solution's y-value appears to be 12.

$y = -8x - 4$ | $y = 4x + 20$

$y = -8(-2) - 4$ | $y = 4(-2) + 20$

$y = 16 - 4$ | $y = -8 + 20$

$y = 12$ | $y = 12$

Yes, (−2, 12) is the solution to the simultaneous linear equations $y = -8x - 4$ and $y = 4x + 20$.

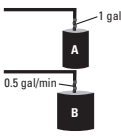
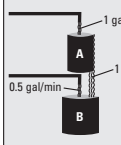
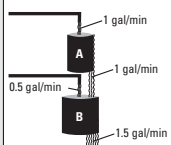
C2, Solving Simultaneous Linear Equations

Skill Extender

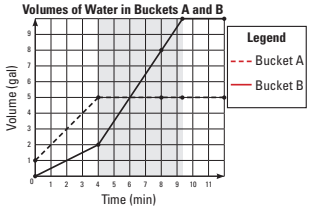
Name _____ Date _____

Activity 22 – Real-World Simultaneous Linear Equations

The diagram shows a 5-gallon bucket, Bucket A, positioned over a 10-gallon bucket, Bucket B. At the start, Bucket A has 1 gallon of water, and Bucket B is empty. Water is added to Bucket A at a rate of 1 gallon per minute. Water is added to Bucket B at a rate of 0.5 gallon per minute. When Bucket A is full (reaches its capacity of 5 gallons), it overflows into Bucket B. When Bucket B is full, it overflows onto the ground. The following equations, table, and graph describe the volumes of water in each of the buckets over time. *Hint: Notice that a different pair of simultaneous linear equations applies during the three different periods of time indicated.*

Scenario:	1. Both Buckets are Filling	2. Bucket A is Full and is Overflowing into Bucket B	3. Both Buckets are Full
Diagram:			
Volume Equations:	$A = t + 1$ and $B = 0.5t$	$A = 5$ and $B = 1.5t - 4$	$A = 5$ and $B = 10$
Period of Time (min):	For $0 \leq t \leq 4$	For $4 \leq t \leq 9.\overline{3}$	For $t \geq 9.\overline{3}$

t (min)	A (gal)	B (gal)
0	1	0
4	5	2
8	5	8
$9.\overline{3}$	5	10
11	5	10



1. Complete the graph by adding lines to the Legend.

2. Identify the time at which the buckets have the same volume of water. t = 6 min

3. When the buckets have the same volume of water in them, what is the volume of water in each bucket? 5 gal

4. When the buckets have the same volume of water in them, what pair of simultaneous linear equations apply?

$A = 5$ and $B = 1.5t - 4$

5. Using the equations from question 4, verify the answers to question 2 and question 3 in the workspace at right.

Workspace (for question 5)

For $4 \leq t \leq 9.\overline{3}$, $A = 5$ and $B = 1.5t - 4$

at t = 6 min, $A = 5$ and $B = 1.5(6) - 4$

$B = 9 - 4$

$B = 5$

Yes, both Bucket A and Bucket B have 5 gallons of water at t = 6 minutes.

C3, Volume of Cylinders, Cones, and Spheres

Skill Checker

Name _____ Date _____

Activity 75 – Volume of Cylinders, Cones, and Spheres Checkup

1. Which is NOT an appropriate method to solve for the volume of the cylinder?

A $V = \pi(10\text{ m})^2(30\text{ m})$

B $V = \pi(\frac{20\text{ m}}{2})^2(30\text{ m})$

C $V = \pi(20\text{ m})^2(30\text{ m})$

D $V = (314\text{ m}^2)(30\text{ m})$

2. Which is the best estimate of the volume of the shaded portion of the sphere?

A 30 mm³

B 50 mm³

C 60 mm³

D 110 mm³

3. Which of the following correctly describes the formula for the volume of a cylinder?

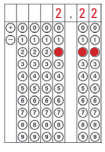
A It is numerically equal to the area of the base, πr^2, but the units are cubic units.

B It is equal to the area of the base, πr^2, divided by the cylinder's height.

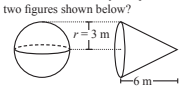
C It is equal to one-third the volume of a cone of equal height and diameter.

D It is equal to the area of the base, πr^2, multiplied by the cylinder's height.

4. A traffic cone has a base diameter of 1.65 feet and a height of 3.11 feet. What is the volume of the cone in cubic feet to the closest hundredths? Use 3.14 for π. Record your answer and fill in the bubbles. Use the correct place value and sign.



5. Which statement correctly compares the volumes of the two figures shown below?



A The volumes are the same.

B The cone has one-third the volume of the sphere.

C The cone has one-half the volume of the sphere.

D The sum of the volumes is 36π m³.

6. The cone's volume is 6π ft³. What is the height of the cone?

A 0.5 ft

B 1 ft

C 2 ft

D 3 ft

7. The moon's diameter is approximately 2,160 miles. Assuming the moon is a perfect sphere, which of the following is the best estimate of its volume?

A 5.3×10^9 mi³

B 4.2×10^{10} mi³

C 3.7×10^6 mi³

D 1.5×10^7 mi³

8. A cylindrical barrel has a base area of 9 square feet and a height of 4.2 feet. The barrel is two-thirds full of sand. How many cubic feet of sand is in the barrel? Record your answer and fill in the bubbles. Use the correct place value and sign.