Key

Mathematics Grade 7 Sample Items

Question 1

Line Guide

Enter the value of $\frac{3}{4} + \frac{7}{12} - (-4)$.

$5\frac{1}{3}$

1	2	3	$\frac{1}{2}$
4	5	6	
7	8	9	
0	.	(-)	

$\frac{9}{12} + \frac{7}{12} + \frac{48}{12}$

$\frac{64}{12} = 5\frac{4}{12}$

$= 5\frac{1}{3}$

Mathematics Grade 7 Sample Items — Training

Question 2

Line Guide

Mark buys a wooden board that is $7\frac{1}{2}$ feet long. The cost of the wooden board is $0.50 per foot, including tax.

Enter the total cost, in dollars, of the wooden board.

$3.75

1	2	3	
4	5	6	
7	8	9	
0	.	(-)	

$$\begin{array}{r} 7.5 \\ \times .5 \\ \hline 3.75 \end{array}$$

$3.75

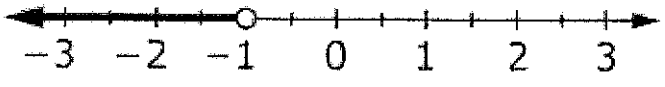
Mathematics Grade 7 Sample Items

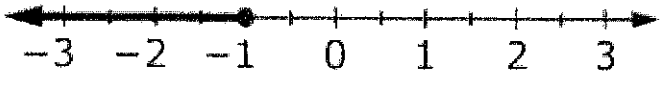
Question 3

Which number line shows the solution to the inequality $-3x - 5 < -2$?

a)


b)


c)


d)


$+5 \quad +5$

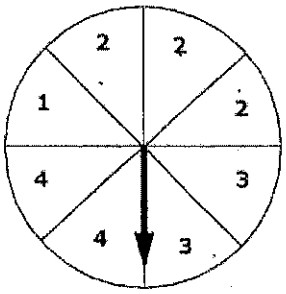
$-3x < 3$

$\frac{-3x}{-3} < \frac{3}{-3}$

$x > -1$

Question 4

The spinner has 8 equal-sized sections, each labeled 1, 2, 3, or 4. The arrow on the spinner is spun.



What is the probability of the arrow stopping on a section labeled with a 2?

(a) $\frac{1}{4}$

(b) $\frac{1}{8}$

(c) $\frac{3}{8}$

(d) $\frac{3}{4}$

Mathematics Grade 7 Sample Items

Question 5

Enter the value of the expression.

$2.3 \cdot (4 + 12)$ 2.3(16)

36.8

1	2	3
4	5	6
7	8	9
0	.	(-)

16
23
4.8
300
36.8

Mathematics Grade 7 Sample Items

Question 6

Enter the value of p so the expression $\frac{5}{6} - \frac{1}{3}n$ is equivalent to $p(5 - 2n)$.

1/6

1	2	3
4	5	6
7	8	9
0	.	(-)

$p \cdot 5 = \frac{5}{6}$

$p = 1/6$

In the given equation, a, b, and c are nonzero rational numbers.

$$a \cdot b = c$$

Given this equation, drag one number into each box to complete four true equations.

a
b
c
$-a$
$-b$
$-c$

$-a \cdot \boxed{-b} = c$

$\boxed{-a} \cdot \boxed{b} = -c$

OR $a \cdot -b = -c$

$\frac{\boxed{-c}}{-b} = a$

$\frac{\boxed{c}}{\boxed{-b}} = -a$

OR $\frac{-c}{b}$

Mathematics Grade 7 Sample Items

Question 8

George earns $455 per week. George receives a 20% raise.

How can George calculate his new weekly pay rate?

Select **all** calculations that will result in George's new weekly pay rate.

- ◯ divide $455 by 0.20
- ◯ divide $455 by 1.20
- ◯ multiply $455 by 0.20
- ◉ multiply $455 by 1.20
- ◉ solve for x: $\frac{x}{455} = \frac{120}{100}$
- ◯ solve for x: $\frac{455}{x} = \frac{20}{100}$

Question 9

Alex claims that when $\frac{1}{4}$ is divided by a fraction, the result will be greater than $\frac{1}{4}$.

To convince Alex that this statement is only sometimes true:

Part A: Drag one digit into each box to create an expression that is greater than $\frac{1}{4}$.

Part B: Drag one digit into each box to create an expression that is not greater than $\frac{1}{4}$.

1 2 3 4 5 6 7 8 9

Part A: Expression greater than $\frac{1}{4}$

$$\frac{1}{4} \div \frac{\square}{\square}$$

Part B: Expression not greater than $\frac{1}{4}$

$$\frac{1}{4} \div \frac{\square}{\square}$$

Part A

any fraction smaller than 1
such as 1/5, 1/6, 1/2, 3/4

Part B

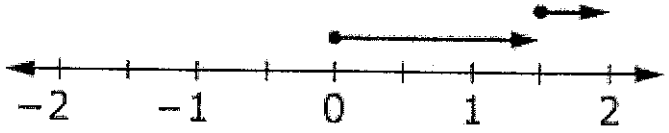
any fraction greater than 1
such as $\frac{4}{3}, \frac{5}{4}, \frac{7}{2}$

Mathematics Grade 7 Sample Items

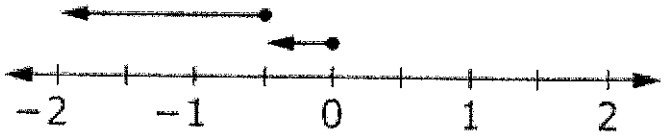
Question 10

Which number line model represents the sum of $1\frac{1}{2} + (-\frac{1}{2})$?

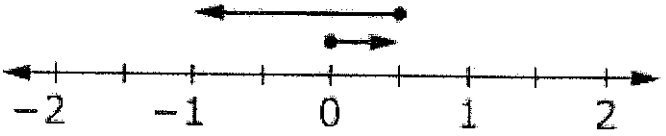
a



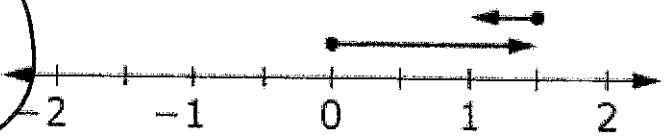
b



c



d



Mathematics Grade 7 Sample Items

Question 11

Which expression is equivalent to $-8(10x - 3)$?

(a) $-80x + 24$

(b) $-80x - 24$

(c) $-80x - 3$

(d) $-80x + 3$

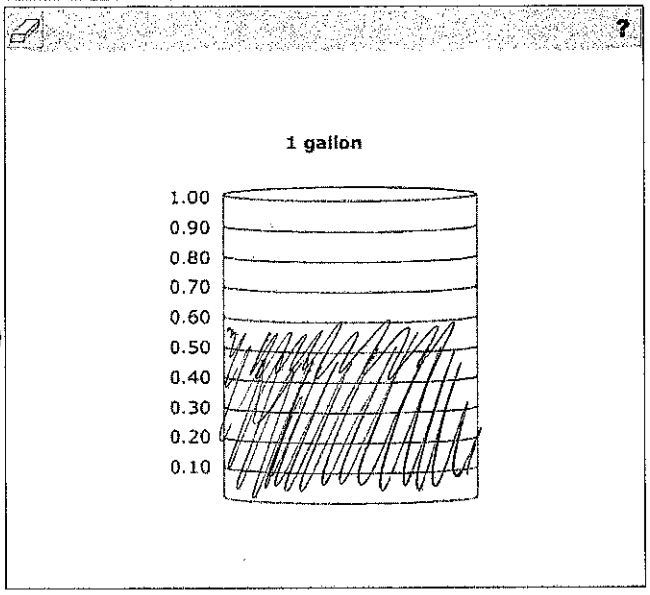
$-80X+24$

Tim makes 80 gallons of paint by mixing 48 gallons of gray paint with 32 gallons of white paint.

What part of every gallon is gray paint?

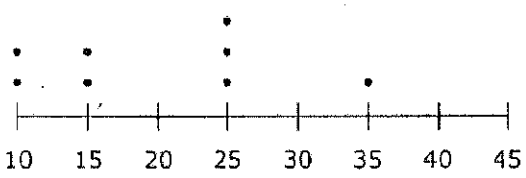
The model represents 1 gallon of mixed paint. Select the bars to show how much of the gallon is gray paint.

$\frac{48}{80} = \frac{6}{10} = \frac{3}{5} = .6$



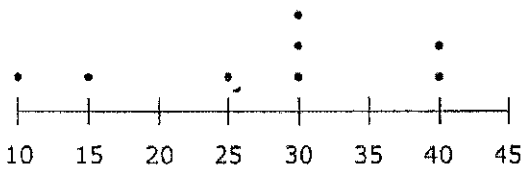
Mr. Anthony wants to know how some student athletes are improving in the number of push-ups they can do.

These dot plots show the number of push-ups each student was able to do last month and this month.



Number of Push-ups Last Month

$10(2) + 15(2) + 25(3) + 35$
$20 + 30 + 75 + 35$
$= 160/8 = 20$



Number of Push-ups This Month

$10 + 15 + 25 + 30(3) + 40(2)$
$10 + 15 + 25 + 90 + 80$
$220/8 = 27.5$

What is the increase in the mean number of push-ups from last month to this month?

7.5

$27.5 - 20$

Mathematics Grade 7 Sample Items

Question 14

Enter the value of n so the expression $(-y + 5.3) + (7.2y - 9)$ is equivalent to $6.2y + n$.

-3.7

1	2	3
4	5	6
7	8	9
0	.	(-)

5.3 - 9

9.0
- 5.3
-3.7

Mathematics Grade 7 Sample Items

Question 15

This table shows a proportional relationship between x and y.

x	y
4	48
5	60
8	96

48/4 = 12
60/5 = 12
96/8 = 12

r = 8

Find the constant of proportionality (r). Using the value for r, enter an equation in the form of $y = rx$.

y = 8x

1	2	3	x	y	+	−	•	÷
4	5	6			<	≤	=	≥	>
7	8	9			÷	$\square^{\square}$	$(\square)$	$\lvert\square\rvert$	π
0	.	(-)							

Question 16

Dave buys a baseball for $15 plus an 8% tax. Mel buys a football for $20 plus an 8% tax.

Enter the difference, in dollars, of the amounts Dave and Mel pay, including tax. Round your answer to the nearest cent.

$5.40

1	2	3
4	5	6
7	8	9
0	.	(-)

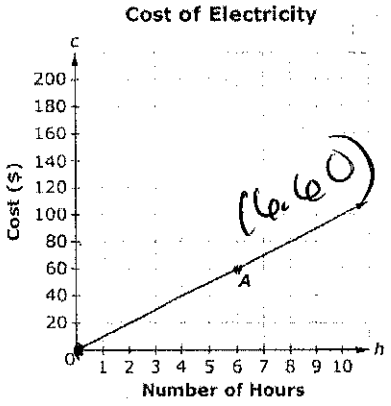
$15(1.08) = 16.20$

$20(1.08) = 21.60$

$21.60 - 16.20 = 5.40$

Question 17

This graph shows a proportional relationship between the number of hours (h) a business operates and the total cost (c) of electricity.



Select True or False for each statement about the graph.

Select True or False for each statement about the graph.

	True	False
Point A represents the total cost of electricity when operating the business for 6 hours.	☑	☐
The total cost of electricity is $8 when operating the business for 80 hours.	☐	☑
The total cost of electricity is $10 when operating the business for 1 hour.	☑	☐

Mathematics Grade 7 Sample Items

Training Student

Question 18

Determine whether each statement is true for all cases, true for some cases, or not true for any case.

	True for all cases	True for some cases	Not true for any case
Two vertical angles form a linear pair.	☐	☐	☑
If two angles are supplementary and congruent, they are right angles.	☑	☐	☐
The sum of two adjacent angles is 90°.	☐	☑	☐
The measure of an exterior angle of a triangle is greater than every interior angle of the triangle.	☐	☑	☐

Mathematics Grade 7 Sample Items

Training S

Question 19

The entry fee to the fair is $4.00. Each ride requires a ticket that costs $0.50. Heidi spent a total of $12.00.

How many tickets did Heidi purchase?

4 + .50X = 12

.50X = 8

X = 16

(a) 6

(b) 16

(c) 24

(d) 32

Question 20

Shelly incorrectly solves the equation $\frac{1}{2}(c + 6) = 7$. Her work is shown.

Part A:

Select **all** the steps that show an error based on the equation in the previous step.

Part B:

Use the number line to show the correct solution of the given equation.

Part A:

$\frac{1}{2}(c + 6) = 7$

Step 1: $\frac{1}{2}c + 6 = 7$

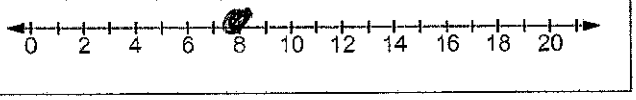
Step 2: $\frac{1}{2}c = 7 + 6$

Step 3: $\frac{1}{2}c = 13$

Step 4: $c = 13 \div 2$

Step 5: $c = 6\frac{1}{2}$

Part B: **Correct Solution**



$\frac{1}{2}(c+6)=7$

$\frac{1}{2}c+3=7$

$-3 \quad -3$

$\frac{1}{2}c=4$

$c=8$

Question 21

David uses $\frac{1}{2}$ cup of apple juice for every $\frac{1}{4}$ cup of cranberry juice to make a fruit drink.

Enter the number of cups of apple juice David uses for 1 cup of cranberry juice.

2

1 2 3 ÷ =
4 5 6
7 8 9
0 . (-)

$\frac{\frac{1}{2}}{\frac{1}{4}} = \frac{x}{1}$

$\frac{4}{1}\frac{1}{4}x = \frac{1}{2}\cdot\frac{4}{1}$

$x = 2$

Mathematics Grade 7 Sample Items **Training Student**

Question 22

A store is having a sale. Each customer receives either a 15% discount on purchases under $100 or a 20% discount on purchases of $100 or more. Kelly is purchasing some clothes for $96.60 before the discount. She decides to buy the fewest packs of gum that will increase her purchase to over $100. The price of each pack of gum is $0.79.

After the discount, how much less will Kelly pay by purchasing the clothes and the gum instead of purchasing only the clothes? (Assume there is no sales tax to consider.)

(a) $1.05

(b) $1.67

(c) $3.69

(d) $3.87

96.60(.85)
$82.11

96.60
+ .79
97.39
+ .79
98.18
+ .79
98.97
+ .79
99.76
+ .79
100.55

100.55(.80)
$80.44

Mathematics Grade 7 Sample Items **Training Student**

Question 23

Aimee has $10.00 to spend on school supplies. The following table shows the price of each item in the school store. No sales tax is charged on these items.

Item	Price
Eraser	$0.89
Folder	$1.29
Notebook	$2.35
Pen	$0.70

Determine if Aimee can buy the combination of items with her $10.00. Select Yes or No for each combination of items.

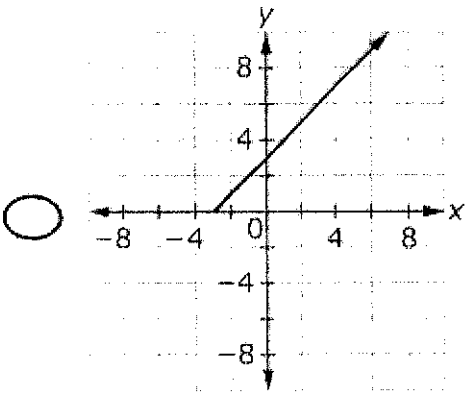
	Yes	No	
5 folders and 5 pens	☑	☐	9.95
6 pens and 6 erasers	☑	☐	9.54
1 pen and 4 notebooks	☐	☑	10.10
3 folders and 7 erasers	☐	☑	10.10
4 folders and 2 notebooks	☑	☐	9.80

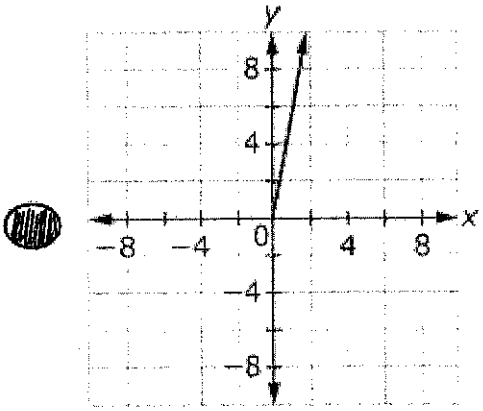
Mathematics Grade 7 Sample Items

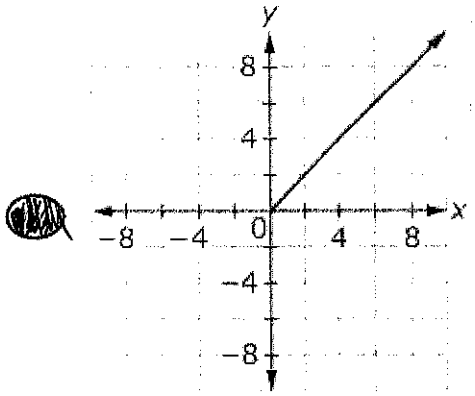
Question 24

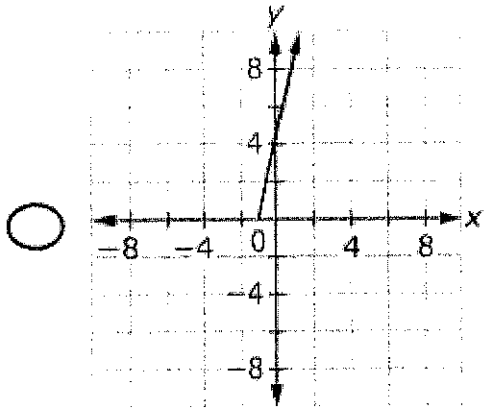
Select **all** the graphs that show a proportional relationship between x and y.

must pass through (0,0)









Mathematics Grade 7 Sample Items

Question 25

A scale factor of 3.5 maps Figure A onto Figure B.

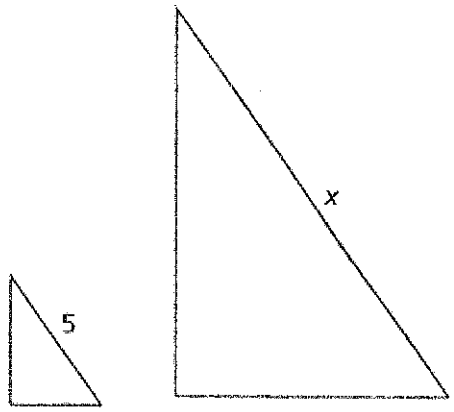


Figure A Figure B

3.5
5
17.5

Enter the value of x.

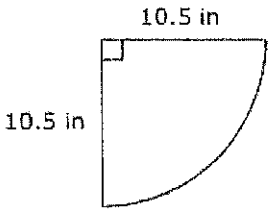
17.5

1	2	3
4	5	6
7	8	9
0	.	(-)

Mathematics Grade 7 Sample Items

Question 26

A corner shelf is $\frac{1}{4}$ of a circle and has a radius of 10.5 inches.



Enter the area of the shelf, in square inches. Round your answer to the nearest hundredth.

86.59

1	2	3
4	5	6
7	8	9
0	.	(-)

$\frac{1}{4} \cdot \pi \cdot r^2$

$\frac{1}{4} \cdot \pi \cdot 10.5^2$

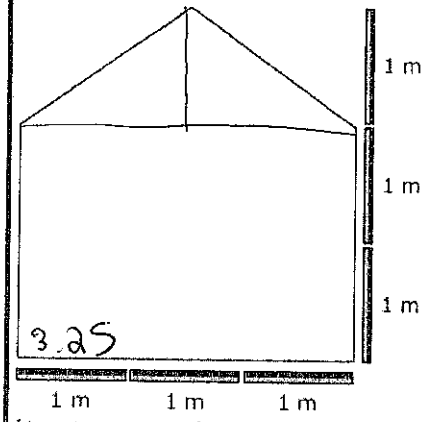
86.59

Mathematics Grade 7 Sample Items

Question 27

Training Stu

John needs to paint one wall in his school. He knows that 1 can of paint covers an area of 24 square feet. John uses a meter stick to measure the dimensions of the wall as shown.



[1 meter = approximately 39 inches]

$9.75(6.5) = 63.375\ ft^2$

$\frac{1}{2}(9.75)(3.25)$ 15.84375

79.21

$\frac{39}{12} = 3.25\ ft$

$\frac{1\ can}{24} = \frac{x}{79.21}$

3.3

What is the **fewest** number of cans of paint John can use to paint the wall?

4

Mathematics Grade 7 Sample Items

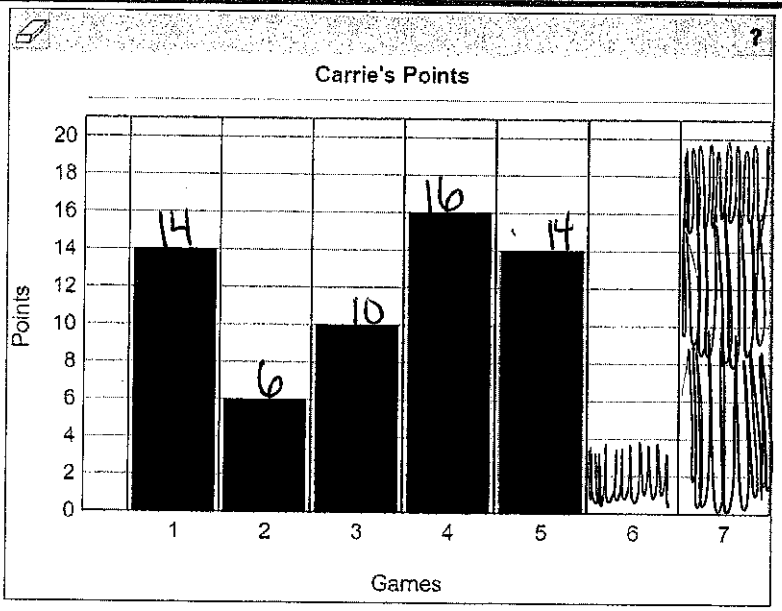
Question 28

Training Studen

Carrie's basketball team has played 5 games. The number of points Carrie scored in each game is shown in the bar graph.

Determine possible point totals for games 6 and 7 so that the range of the data set increases, but the mean and median stay the same.

Select point totals above the labels 6 and 7 to complete the bar graph.



Range = 16 − 6 = 10

Mean = $\frac{60}{5}$ = 12

Med = 14

4 6 10 (14) 14 16 ~~18~~ 20

60

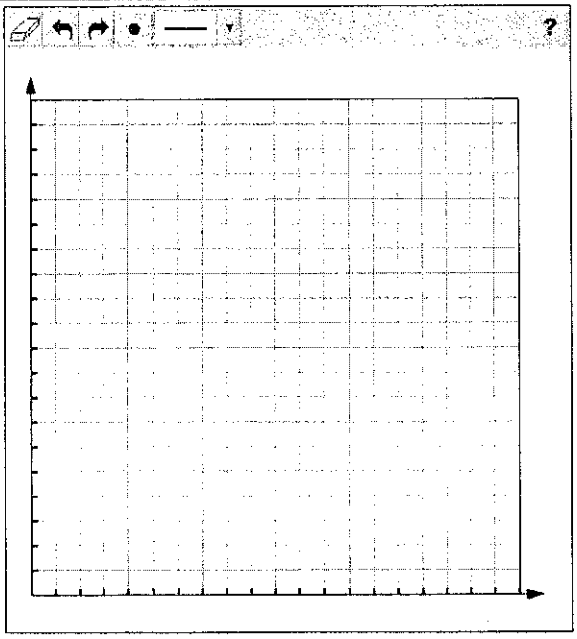
answers may vary.

Question 29

Micah constructs a rectangular prism with a volume of 360 cubic units. The height of his prism is 10 units.

Micah claims that the base of the prism must be a square.

Draw a base that shows Micah's claim is incorrect.



$V = l \cdot w \cdot h$

$360 = l \cdot w \cdot 10$

$36 = l \cdot w$

any combo:

1 by 36

2 by 18

3 by 12

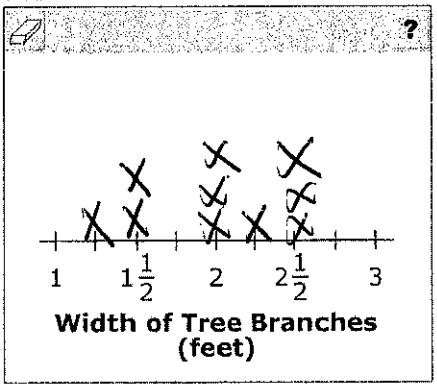
4 by 9

Question 30

A scientist measures the width of ten different tree branches, in inches.

The results, in inches, are 18, 24, 27, 30, 21, 18, 24, 30, 30, and 24.

Complete the line plot to represent all of the results, in **feet**, by clicking above each tick mark to make an X appear.



$18 \rightarrow 1\frac{1}{2}$ ✓

$24 \rightarrow 2$ ✓✓

$27 \rightarrow 2\frac{1}{4}$

$30 \rightarrow 2\frac{1}{2}$ ✓✓

$21 \rightarrow 1\frac{3}{4}$

Mathematics Grade 7 Sample Items

Question 31

This table contains x and y values in equivalent ratios. Fill in the missing value in the table.

x	y
2	6
5	
7	21
9	27

$\frac{2}{6} = \frac{5}{y}$

$2y = 30$

$y = 15$

Mathematics Grade 7 Sample Items

Training Stu

Question 32

An expression is shown.

$3(2x + 5)$

Use the drop-down menus create an equivalent expression.

$3(2x + 5) =$ [ ] $x +$ [ ]

$3(2x+5)$

$6x+15$