

# 7<sup>th</sup> Grade Practice Midterm

## 7<sup>th</sup> Grade Math

Name: \_\_\_\_\_

### 1. Solve. Do not use a calculator.

a.  $6 - 7 + 2^3$

$$6 - 7 + 8$$

$$-1 + 8$$

$$\boxed{7}$$

d.  $(-5) - (-7)$

$$\boxed{-12}$$

g.  $-8 \div 4$

$$\boxed{-2}$$

j.  $(-6) - (-5)$

$$\boxed{-11}$$

m.  $\frac{-6}{2}$

$$\boxed{-3}$$

b.  $-8 + 2$

$$\boxed{-6}$$

e.  $3 \bullet -7$

$$\boxed{-21}$$

h.  $\frac{36}{-9}$

$$\boxed{-4}$$

k.  $5 \bullet -7$

$$\boxed{-35}$$

n.  $-5^2$

$$\begin{array}{l} -5 \cdot 5 \\ \boxed{-25} \end{array}$$

c.  $5 + 3$

$$\boxed{8}$$

f.  $-7 \bullet -3$

$$\boxed{21}$$

i.  $-5 + 6$

$$\boxed{1}$$

l.  $-15 \div -3$

$$\boxed{5}$$

### 2. Solve. Do not use a calculator.

a.  $\frac{1}{5} + \frac{3}{4}$

$$\frac{4}{20} + \frac{15}{20} = \boxed{\frac{19}{20}}$$

b.  $\frac{5}{8} \bullet 5\frac{1}{2}$

$$\frac{5}{8} \bullet \frac{11}{2} = \frac{55}{16} = \boxed{3\frac{7}{16}}$$

KCF  
c.  $\frac{1}{2} \div \frac{3}{4}$

$$\frac{1}{2} \cdot \frac{4}{3} = \boxed{\frac{2}{3}}$$

d.  $\frac{1}{8} \cdot \frac{5}{6}$

$$\frac{3}{24} - \frac{20}{24} = \boxed{\frac{-17}{24}}$$

e.  $4\frac{3}{4} - 1\frac{1}{2}$

$$\frac{19}{4} - \frac{3}{2}$$

$$\frac{19}{4} - \frac{6}{4} = \frac{13}{4} = \boxed{3\frac{1}{4}}$$

f.  $4\frac{3}{4} + 1\frac{1}{2}$

$$\frac{19}{4} + \frac{3}{2}$$

$$\frac{19}{4} + \frac{6}{4} = \frac{25}{4} = \boxed{6\frac{1}{4}}$$

g.  $4\frac{3}{4} \div 1\frac{1}{2}$

$$\frac{19}{4} \div \frac{3}{2}$$

$$\frac{19}{4} \cdot \frac{2}{3} = \frac{19}{6} = \boxed{3\frac{1}{6}}$$

### 3. Convert each of the following to a decimal.

a.  $\frac{4}{9}$

$$4 \div 9 = \boxed{0.\overline{4}}$$

b.  $\frac{5}{7}$

$$5 \div 7 = \boxed{0.714\ldots}$$

c.  $3\frac{3}{8}$

$$\frac{27}{8}$$

$$27 \div 8$$

$$\boxed{3.375}$$

### 4. Distribute.

a.  $2(x-6)$

$$\boxed{2x - 12}$$

b.  $-3(a+5)$

$$\boxed{-3a - 15}$$

c.  $5(4x-3)$

$$\boxed{20x - 15}$$

d.  $7(6a+4)$

$$\boxed{42a + 28}$$

## 5. Combine Like Terms and Simplify.

a.  $(2m) + 3y - 3m$

$$\boxed{-1m + 3y}$$

b.  $5(-x) + 8 + 8x$

$$\boxed{7x + 13}$$

c.  $3m + 5y - 1m$

$$\boxed{2m + 5y}$$

d.  $7 - 2x + 8 + 5x$

$$\boxed{3x + 15}$$

e.  $8x + 3(2x - 4)$

$$8x + 6x - 12$$

$$\boxed{14x - 12}$$

f.  $5x - 2(4x - 9)$

$$5x - 8x + 18$$

$$\boxed{-3x + 18}$$

## 6. Solve. You must show all of your steps.

a.  $x + 5 = 40$   
 $-5 \quad -5$

$$\boxed{x = 35}$$

b.  $\frac{10x}{14} = \frac{25}{10}$

$$x = 2\frac{5}{10}$$

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

c.  $3x - 4 = 16$   
 $+4 \quad +4$

$$\frac{3x}{3} = \frac{20}{3}$$

$$\boxed{x = 6\frac{2}{3}}$$

d.  $\frac{x}{5} + 8 = 13$   
 $-8 \quad -8$

$$\frac{x}{5} = 5$$

$$\boxed{x = 25}$$

e.  $4(x - 1) = 20$

$$4x - 4 = 20$$

$$4x = 24$$

$$\boxed{x = 6}$$

f.  $(7x) + 10 - 2x = 25$

$$5x + 10 = 25$$

$$5x = 15$$

$$\boxed{x = 3}$$

g.  $4x + 8 = 2x - 10$   
 $-2x \quad -2x$

$$2x + 8 = -10$$

$$2x = -18$$

$$\boxed{x = -9}$$

h.  $-4(x - 5) > -2$

$$-4x + 20 > -2$$

$$-4x > -22$$

$$x < 5\frac{1}{2}$$

$$\boxed{x < 5\frac{1}{2}}$$

i.  $5x + 3(4x - 6) = 2x + 7x - 5$

$$\begin{array}{rcl} 5x + 12x - 18 & = & 2x + 7x - 5 \\ 17x - 18 & = & 9x - 5 \\ -9x & & -9x \\ 8x - 18 & = & -5 \\ +18 & & +18 \\ 8x & = & 13 \\ \frac{8x}{8} & = & \frac{13}{8} \end{array}$$

$x = \frac{13}{8}$

j.  $(8x) + 7 + x < 2(x - 8)$

$$\begin{array}{rcl} 9x + 7 & < & 2x - 16 \\ -2x & & -2x \\ 7x - 7 & < & -16 \\ +7 & & +7 \\ 7x & < & -9 \\ \frac{7x}{7} & < & \frac{-9}{7} \end{array}$$

$x < -1\frac{2}{7}$

k.  $\frac{x}{6} \neq \frac{6}{9}$

$$\frac{9x}{9} = \frac{36}{9}$$

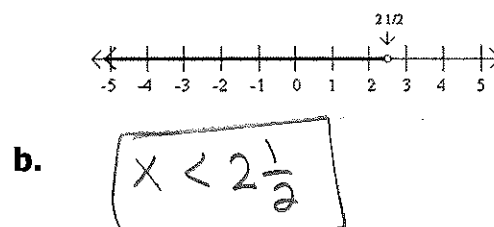
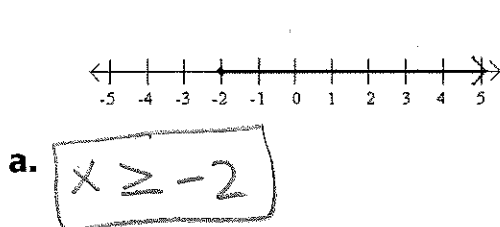
$x = 4$

l.  $\frac{2}{8} \neq \frac{3}{x}$

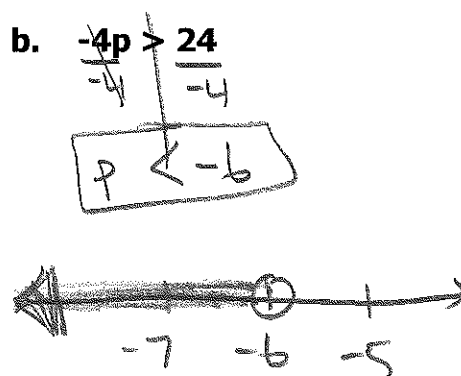
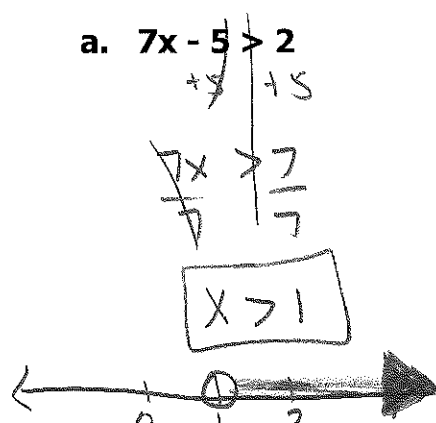
$$\frac{2x}{2} = \frac{24}{2}$$

$x = 12$

7. Write the inequality.



8. Graph the following.



9. Hugo is buying pizza to serve a party of at least 125 guests. A large pizza has 12 slices and he already bought 36 slices of pizza. Write an inequality to describe the situation, if  $p$  represents the number of pizzas he still needs to buy.

$$12x + 36 \geq 125$$

10. Solve.

- a. A store sells 5 pencils for one dollar. What will it cost for 8 pencils?

$$\begin{array}{r} \text{pen} \\ 5 \\ \hline \$1 \end{array} \quad \times \quad \begin{array}{r} \text{pen} \\ 8 \\ \hline x \end{array}$$

$$\frac{8}{5} = \frac{\$x}{\$1}$$

$$\boxed{\$1.60 = x}$$

- b. According to a label there are 50 calories in 2 servings of lunch meat. How many calories are there in 3.5 servings?

$$\begin{array}{r} \text{cal} \\ 50 \\ \hline \text{serv} 2 \end{array} \quad \times \quad \begin{array}{r} \text{cal} \\ x \\ \hline \text{serv} 3.5 \end{array}$$

$$\frac{2x}{2} = \frac{175}{2}$$

$$\boxed{x = 87.5 \text{ calories}}$$

- c. A brownie recipe calls for  $1\frac{1}{4}$  cups chocolate chips. If you wish to triple the recipe, how many cups of chocolate chips would you need?

$$1\frac{1}{4} \cdot 3$$

$$\frac{5}{4} \cdot \frac{3}{1} = \frac{15}{4} = \boxed{3\frac{3}{4} \text{ cups}}$$

- d. A car is driving 65 miles per hour. After a 9 hour drive, the car is at its destination. How far did the car drive?

$$\begin{array}{r} \text{miles} \\ 65 \\ \hline \text{hour} 1 \end{array} \quad \times \quad \begin{array}{r} x \\ \hline 9 \text{ hour} \end{array}$$

$$\frac{1x}{1} = \frac{585}{1}$$

$$\boxed{x = 585 \text{ miles}}$$

- e. Joel runs  $\frac{1}{4}$  the distance around the track every  $\frac{1}{3}$  of a minute. How many times around the track can he run in  $1\frac{1}{2}$  minutes?

$$\begin{array}{r} \text{laps} \\ \frac{1}{4} \\ \hline \text{min} \frac{1}{3} \end{array} \quad \times \quad \begin{array}{r} \text{laps} \\ x \\ \hline 1\frac{1}{2} \text{ min} \end{array}$$

$$\frac{1}{4} \cdot 1\frac{1}{2} = \frac{1}{3}x$$

$$\frac{1}{4} \cdot \frac{3}{2} = \frac{1}{3}x$$

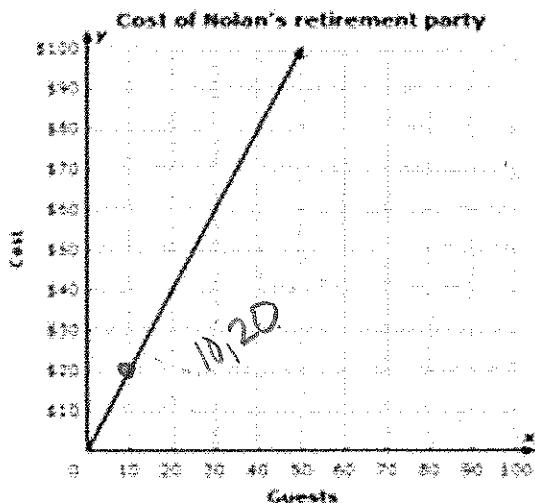
$$\frac{3}{1} \cdot \frac{3}{8} = \frac{1}{3}x \cdot \frac{3}{1}$$

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

$$\boxed{1\frac{1}{8} \text{ laps}}$$

11. Decide whether the graph or table is proportional or not. If it is proportional, find the rate of change and write an equation.

a.

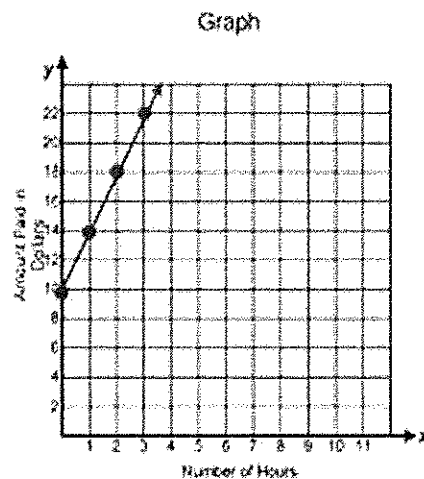


Proportional/Not

Rate of change:  $\frac{\$20}{10 \text{ guests}} = \$2/\text{guest}$

Equation:  $y = 2x$

B.



Proportional/Not

Rate of change: \_\_\_\_\_

Equation: \_\_\_\_\_

c.

Hours (x)	4	7	10
Miles (y)	48	84	120

$$\frac{48}{4} = 12, \quad \frac{84}{7} = 12, \quad \frac{120}{10} = 12$$

Proportional/Not

Rate of change: 12

Equation:  $y = 12x$

d.

x	y
2	3
4	6
8	12
12	14

$$\frac{3}{2} = 1.5, \quad \frac{6}{4} = 1.5, \quad \frac{12}{8} = 1.5, \quad \frac{14}{12} = 1.1\bar{6}$$

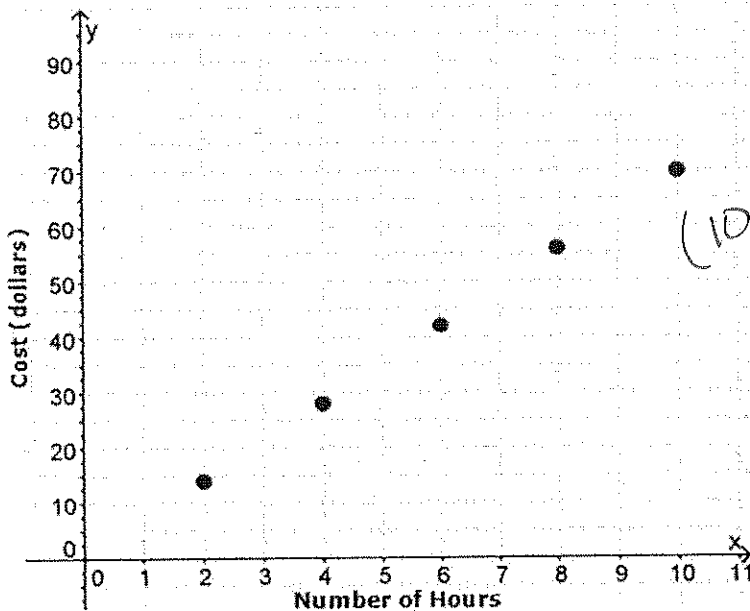
Proportional/Not

Rate of change: \_\_\_\_\_

Equation: \_\_\_\_\_

12. The graph below shows the amounts Walt was charged the last 5 times he parked his car downtown. What is the price per hour that the city charges its drivers?

Parking Costs



$$\frac{\$70}{10 \text{ hrs}}$$

$$= \$7/\text{hr}$$

13. Find the unit rate (constant of proportionality) of the following scenarios...

- a. Six hair ties cost \$3.25, how much does one hair tie cost?

$$\frac{\$3.25}{6} = \frac{x}{1}$$

$$6x = 3.25$$

$$x = \$0.54$$

- b. John drove 96 miles on 4 gallons of gas. How far can he drive on one gallon of gas?

$$\frac{96 \text{ miles}}{4 \text{ gallons}} = \frac{x \text{ miles}}{1 \text{ gallon}}$$

$$\frac{96}{4} = \frac{x}{1}$$

$$24 \text{ miles} = x$$

- c. It costs \$7.99 for 3 gallons of milk, how much does it cost of 1 gallon of milk?

$$\frac{\$7.99}{3} = \frac{x}{1}$$

$$\frac{7.99}{3} = \frac{x}{1}$$

$$\$2.66 = x$$

14. What is the constant of proportionality for the equation below?

$$a = 0.7p$$

$$0.7$$

**15. Convert the following measurements. Show all steps.**

(Hint: 1 foot = 12 in., 1 cup = 8 fl oz, 1 inch = 2.54 cm)

a. 48 in. = \_\_\_\_\_ feet

$$\begin{array}{r} \text{in} \\ 48 \\ \hline \times \\ \text{ft} \end{array} = \begin{array}{r} 12 \text{ in} \\ \hline 1 \text{ ft} \end{array}$$

$$\frac{48}{12} = \frac{12 \times}{12}$$

$$4 \text{ ft} = x$$

b. 36 cm = \_\_\_\_\_ inch

$$\begin{array}{r} \text{cm} \\ 36 \\ \hline \times \\ \text{in} \end{array} = \begin{array}{r} 2.54 \text{ cm} \\ \hline 1 \text{ in} \end{array}$$

$$\frac{36}{2.54} = \frac{2.54 \times}{2.54}$$

$$14.17 \text{ in.} = x$$

c. 64 fl oz = \_\_\_\_\_ cups

$$\begin{array}{r} \text{fl oz} \\ 64 \\ \hline \times \\ \text{cups} \end{array} = \begin{array}{r} 8 \text{ fl oz} \\ \hline 1 \text{ cup} \end{array}$$

$$\frac{64}{8} = \frac{8 \times}{8}$$

$$8 \text{ cups} = x$$

**16. Find the following...**

a. 28% of 92?

$$\frac{28}{100} \times \frac{x}{92}$$

$$\frac{100x}{100} = \frac{2576}{100}$$

$$x = 25.76$$

b. 4% of 306?

$$\frac{4}{100} \times \frac{x}{306}$$

$$\frac{100x}{100} = \frac{1224}{100}$$

$$x = 12.24$$

c. 9.3% of 98?

$$\frac{9.3}{100} \times \frac{x}{98}$$

$$\frac{100x}{100} = \frac{911.4}{100}$$

$$x = 9.114$$

d. 55 is 42% of what?

$$\frac{42}{100} \times \frac{55}{x}$$

$$\frac{42x}{42} = \frac{5500}{42}$$

$$x = 130.95$$

e. What is 25% of 40?

$$\frac{25}{100} \times \frac{x}{40}$$

$$\frac{100x}{100} = \frac{1000}{100}$$

$$x = 10$$

**17. A \$250 bike is on sale for 15% off. What is the new price?**

$$.15 \cdot 250 = 37.5 \leftarrow \text{discount}$$

$$250 - 37.5 = \$212.50$$



18. Ashley bought a dress at \$35.00 and later sold it to Marley for a 70% profit. How much did Ashley sell the dress for?

$$35 \cdot .7 = 24.50 \leftarrow \text{profit}$$

$$35 + 24.50 = \boxed{\$59.40}$$

19. Mr. Moundros goes to MC Sporting goods with a 15% off coupon. He wants to buy a MSU sweatshirt for Miss Drayton. The regular price of the sweatshirt is \$54.99 on sale for 20% off. What is the cost of the sweatshirt after both discounts and Michigan sales tax?

$$\begin{aligned} & \text{15\% off} \leftarrow \text{discount} \\ & .15 \cdot 54.99 = 8.2485 \\ & 54.99 - 8.2485 = \$46.74 \end{aligned}$$

$$\begin{aligned} & \text{20\% off} \leftarrow \text{discount} \\ & .2 \times 46.74 = 9.348 \\ & 46.74 - 9.348 = \$37.39 \\ & \text{6\% tax} \\ & .06 \cdot 37.39 = 2.2434 \\ & \text{tax} \rightarrow = 2.2434 \\ & 37.39 + 2.2434 = \boxed{\$39.63} \end{aligned}$$

20. A pie costs \$12.99. A second pie is  $\frac{1}{3}$  off. Using an estimate, approximately how much will it cost for the 2 pies?

$$\begin{aligned} & 12.99 \div 3 = 4.33 \leftarrow \text{discount} \\ & 12.99 - 4.33 = 8.66 \end{aligned}$$

$$\begin{aligned} & 12.99 + 8.66 \\ & = \boxed{\$21.65} \end{aligned}$$

21. Find each percent of change. Round to the nearest whole number.

a. 90 in to 45 in

$$\frac{\text{change}}{\text{original}} = \frac{90-45}{90} = \frac{45}{90} = 0.5$$

**50% decrease**

b. \$100 to \$14

$$\frac{\text{change}}{\text{original}} = \frac{100-14}{100} = \frac{86}{100} = .86$$

**86% decrease**

22. You have \$550 in saving account that earns 3% simple interest each year. How much will be in your account in 10 years?

$$I = p r t$$

$$I = 550 \cdot .03 \cdot 10 = \$165 \leftarrow \text{interest}$$

$$550 + 165 = \boxed{\$715}$$

