

دليل إيجاد معدلات الوحدة مع الكسور



تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ⇨ المناهج الإماراتية ⇨ الصف السابع ⇨ رياضيات ⇨ الفصل الأول ⇨ ملفات متنوعة ⇨ الملف

تاريخ إضافة الملف على موقع المناهج: 2026-09-06 11:24:38

ملفات اكتب للمعلم اكتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل
منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس

المزيد من مادة
رياضيات:

إعداد: Aghead

التواصل الاجتماعي بحسب الصف السابع



صفحة المناهج
الإماراتية على
فيسبوك

الرياضيات

اللغة الانجليزية

اللغة العربية

التربية الاسلامية

المواد على تلغرام

المزيد من الملفات بحسب الصف السابع والمادة رياضيات في الفصل الأول

دليل حساب النسبة المئوية للتغير منهج ريفيل

1

الوحدة الثالثة: عمليات على الأعداد الصحيحة منهج ريفيل

2

ملازم وحدات الفصل الاول منهج ريفيل تحتوي على شرح الدروس بالإضافة الى تمارين الكتاب على شكل اختر
الاجابة الصحيحة 2026-2027

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مصفوفة المدى والتتابع

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وزارة التربية والتعليم
MINISTRY OF EDUCATION



صف السابع رياضيات ريفيل الوحدة الأولى

Proportional Relationships

احجز مكانك واستعد للامتحان بثقة كاملة

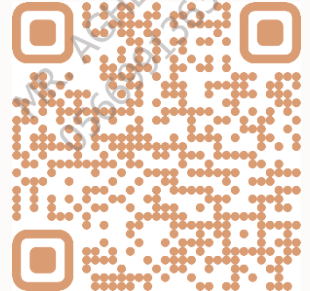
احصل على الشرح الكامل للصف من خلال:

التواصل والحجز عبر الـ Whatsapp
اضغط على الرقم: 0566991363



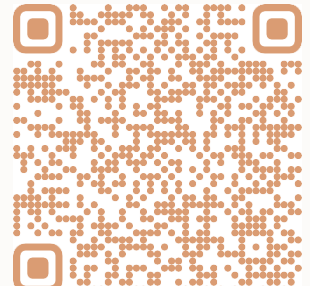
Mr. Aghead

للتواصل والحجز

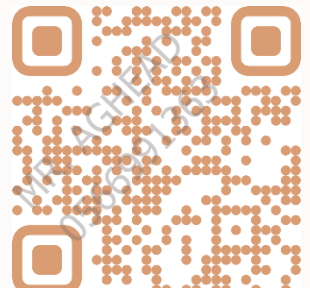


للانتقال إلى المواقع
اضغط هنا

شرح الدروس



انضم للقناة



للتواصل اضغط الرقم:

0566991363

Mr. Aghead

يمكنكم الحصول على

شرح دروس
الفصل كامل



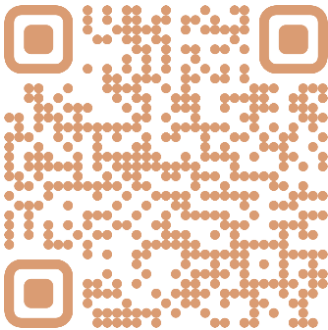
99 ب
درهم فقط

اختبارات

ملازم
محلولة

MR.AGHEAD

0566991363



احصل على الشرح الكامل للصف من خلال:

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اضغط على الرقم: 0566991363

لا تتردد في التواصل
معنا قم بمسح الـ QR

Lesson 1-1: Unit Rates Involving Ratios of Fractions

Mastering Unit Rates with Fractions

Unit rates compare the first quantity per every 1 unit of the second quantity. When these ratios involve fractions, they create "complex fractions" solved using visual models or algebraic division.

Foundations of Unit Rates

The Unit Rate Goal



Quantity 1



Exactly 1 Unit

A unit rate compares a quantity to exactly one unit of another quantity.

Identifying Complex Fractions



Numerator (Fraction)



Denominator (Fraction)

These are fractions where the numerator, denominator, or both are also fractions.

Step-by-Step Division Method

1 Set Up the Division

$$\text{Rate: } \frac{4 \text{ gal}}{\frac{1}{3} \text{ cup}} \rightarrow 4 \div \frac{1}{3}$$

Write the rate as a division problem:
Numerator ÷ Denominator.

2 Multiply by the Reciprocal

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

Rewrite the problem by multiplying the first number by the denominator's inverse.

3 Simplify the Result

$$\frac{4}{1} \times \frac{3}{1} = \frac{12}{1} = 12$$

Final Answer: 12 Gallons per Cup

Multiply the fractions and simplify to find the final unit rate.

دليل إيجاد معدلات الوحدة مع الكسور

خطوات استراتيجية الحل

الحل بطريقة القسمة (الأكثر دقة)

تحويل الكسر المركب لعملية قسمة، ثم الضرب في المقلوب للحصول على الناتج النهائي

4 جالونات لكل $\frac{1}{3}$ كوب

12 جالوناً لكل كوب



$$4 \div \frac{1}{3} \rightarrow 4 \times \frac{3}{1} = 12$$

لكل كوب

36 قدم مربع في قدم مربع



$$36 \div \frac{3}{4} \rightarrow 36 \times \frac{4}{3} = 48$$

قدماً مربعاً لكل ساعة

الاستعانة بالنماذج البصرية

استخدام المخططات الشريطية أو خطوط الأعداد المزدوجة لتمثيل النسب وتوسيعها للوصول للوحدة



استخدام جدول النسب

كتابة القيم في جدول ومضاعفتها (Scaling) حتى تصبح قيمة الكمية الثانية تساوي 1



الكمية الأولى (مثل المسافة/الحجم)	الكمية الثانية (الزمن/الوحدة)
4	$\frac{1}{3}$
8	$\frac{2}{3}$
12	1

المفاهيم الأساسية



معدل الوحدة (Unit Rate)

هو مقارنة الكمية الأولى بوحدة واحدة فقط من الكمية الثانية

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

الكسر المركب (Complex Fraction)
هو كسر يحتوي ببساطة أو مقامه (أو كلاهما) على كسور، مثل $\frac{4}{1/3}$ مقسومة على $1/3$

❖ Example 1, check

Doug entered a canoe race. He paddled 5 miles in $\frac{2}{3}$ hour. What is his average speed in miles per hour? Use any strategy.

1

A) $3\frac{1}{3}$ mph

B) $5\frac{2}{3}$ mph

C) $7\frac{1}{2}$ mph

D) $8\frac{1}{3}$ mph

D	C	B	A
---	---	---	---

❖ Example 2, check

A garden hose was left on in a yard and spilled $\frac{7}{8}$ gallon every $\frac{2}{3}$ minute. Find the average number of gallons spilled per minute. Use any strategy.

2

A) $\frac{7}{12}$ gal/min

B) $1\frac{5}{16}$ gal/min

C) $1\frac{3}{4}$ gal/min

D) $2\frac{1}{3}$ gal/min

D	C	B	A
---	---	---	---

❖ Apply Check:

A walk-a-thon was held at a local middle school. The table gives the average distances and times for four walkers for certain periods of the walk-a-thon. If the total distance of the route was 2 miles, who completed the route first? How long did it take her to complete the route if she walked at a constant rate?

Person	Distance (mi)	Time (min)
Lakeisha	$\frac{7}{8}$	18
Baydan	$\frac{9}{10}$	22
Madison	$\frac{4}{5}$	17

- A) Madison, taking 42.5 minutes
B) Baydan, taking 48.9 minutes
C) Lakeisha, taking $41\frac{1}{7}$ minutes
D) All of them finished at the exact same time

D	C	B	A
---	---	---	---

❖ **Pratice:**

1. A truck driver drove 48 miles in 45 minutes.
At this rate, how many miles can the truck
driver drive in one hour? (Example 1)

4

- A) 54 miles
- B) 60 miles
- C) 64 miles
- D) 72 miles

D	C	B	A
---	---	---	---

2. Russell runs $\frac{9}{10}$ mile in 5 minutes. At this
rate, how many miles can he run in one
minute? (Example 1)

5

- A) $\frac{9}{50}$ mi
- B) $\frac{9}{2}$ mi
- C) $4\frac{1}{2}$ mi
- D) $\frac{10}{45}$ mi

D	C	B	A
---	---	---	---

3. A small airplane flew 104 miles in 50 minutes. At this rate, how many miles can it fly in one hour? ($50 \text{ minutes} = \frac{5}{6} \text{ hour}$)
(Example 1)

6

- A) 115.2 miles
- B) 124.8 miles
- C) 135 miles
- D) 140 miles

D	C	B	A
---	---	---	---

4. DeAndre downloaded 8 apps onto his tablet in 12 seconds. At this rate, how many apps could he download in one minute?
($12 \text{ seconds} = \frac{1}{5} \text{ minute}$) (Example 1)

7

- A) 24 apps
- B) 32 apps
- C) 40 apps
- D) 48 apps

D	C	B	A
---	---	---	---

5. In Lixue's garden, the green pepper plants grew 5 inches in $\frac{3}{4}$ month. At this rate, how many feet can they grow in one month?

(Let 5 inches = $\frac{5}{9}$ foot) (Example 2)

8

A) $\frac{5}{12}$ foot

B) $\frac{5}{9}$ foot

C) $\frac{20}{27}$ foot

D) $\frac{9}{12}$ foot

D

C

B

A

6. Thunder from a bolt of lightning travels

$\frac{1}{10}$ mile in $\frac{1}{2}$ second. At this rate, how many miles can it travel in one second? (Example 2)

9

A) $\frac{1}{20}$ mile

B) $\frac{1}{5}$ mile

C) $\frac{2}{5}$ mile

D) $\frac{1}{2}$ mile

D

C

B

A

7. The average sneeze can travel $\frac{3}{100}$ mile in 3 seconds. At this rate, how far can it travel in one minute? ($3 \text{ seconds} = \frac{1}{20} \text{ minute}$)
(Example 2)

10

- A) $\frac{3}{5}$ mile
B) $\frac{3}{20}$ mile
C) $\frac{9}{100}$ mile
D) $\frac{1}{20}$ mile

D C B A

Lesson 1-2 - Understand Proportional Relationships

Mastering Proportional Relationships in Tables

Two quantities are proportional if the ratios comparing them are equivalent. This guide explains how to test for proportionality in tables and how to identify the "constant of proportionality," which is the unit rate of the relationship.

Step-by-Step Proportionality Test

1. Calculate Unit Ratios

Write each pair of values as a ratio and simplify to a denominator of 1.

x	y
1	7
2	14
3	21
4	28

$\frac{y}{x} \rightarrow \frac{\text{unit}}{1}$

$\frac{7}{1}$
 $\frac{14}{2}$
 $\frac{21}{3}$

2. Compare the Results

ALL RATIOS ARE THE SAME
RELATIONSHIP IS PROPORTIONAL

RATIOS ARE DIFFERENT
RELATIONSHIP IS NONPROPORTIONAL

Identify Nonproportional Indicators

Relationships with "starting fees" or inconsistent increases are nonproportional.

Finding the Constant of Proportionality

The Constant of Proportionality

k^c

This is the constant ratio (y/x) and has the same value as the unit rate.

Unit Rate vs. Constant

If a car travels 24 frames/second, the constant is 24.

PROPORTIONAL:
Pizza Cost
(\$7 per pizza)

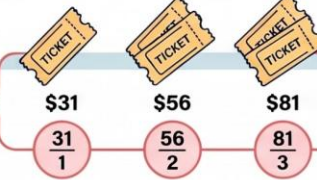
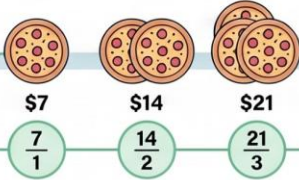
Relationship Type

Ratios (y/x)

Proportional?

NONPROPORTIONAL:
Ticket Cost
(\$25 + \$6 fee)

x	y
1	7
2	14
3	21
4	28



x	y
1	31
2	56
3	81
4	106

فهم العلاقات المتناسبة وتحديدتها

خطوات تحديد العلاقة المتناسبة

الخطوة 3: مقارنة النسب النهائية

مقارنة الأعمار

النسبة الأولى

14 : 7

عاماً : 7 أعوام

النسبة الثانية

19 : 12

عاماً : 12 عاماً

غير متناسبة (النسبة تغيرت)

إذا كانت النسب مبسطة إلى نفس القيمة (مثل 14 : 7 تساوي 2 : 1) فالعلاقة متناسبة، وإلا فهي غير متناسبة.

جدول المقارنة

النتيجة

متناسبة (ثابتة 1:4)

غير متناسبة (النسبة تغيرت)

منظف الزجاج

النسبة الأولى

1 : 4

ماء : 12 ماء

النسبة الثانية

3 : 12

متناسبة (ثابتة 1:4)

ارسم أعمدة مقسمة إلى أجزاء متساوية لتمثيل كل كمية بصرياً والتأكد من تماثل الأجزاء



الخطوة 1: استخراج النسب وتحديدتها

ماء

1 : 4

قم بكتابة العلاقة بين الكميتين في شكل نسبة (مثل نسبة الخل إلى الماء 1 : 4).

ارسم أعمدة مقسمة إلى أجزاء متساوية لتمثيل كل كمية بصرياً والتأكد من تماثل الأجزاء

الخطوة 2: التمثيل باستخدام مخطط الأعمدة

استخرج النسب وتحديدتها

أساسيات التناسب

معدل الوحدة

هو تكلفة أو قيمة الجزء الواحد. ويُستخدم كمعيار للمقارنة بين نسبتين مختلفتين.

العلاقة المتناسبة

تكون الكميتان في علاقة متناسبة إذا كان لهما نسبة ثابتة لا تتغير مهما تغيرت المقادير.

مثال: وصفة عجينة البيتزا

3 : 1

ماء : 1

نسبة الطحين إلى الماء هي 3 : 1 وتبقى هذه النسبة ثابتة سواء صنعت دفعة واحدة أو ثلاث دفعات.

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❖ **Example 1, check**

The recipe for homemade glass cleaner indicates to use a ratio of 1 part vinegar to 4 parts water.

Refer to the recipe for homemade glass cleaner in Example 1. Marcus mixed 1.5 cups of vinegar and 6 cups of water to make his cleaner. Is the relationship between the vinegar and water in the recipe and the vinegar and water in Marcus' cleaning solution a proportional relationship? Explain.

1

- A) Yes; Marcus maintained the 1 part vinegar to 4 parts water ratio.
- B) No; Marcus used too much water compared to the original recipe.
- C) No; Marcus used equal parts of vinegar and water.
- D) Yes; Marcus used double the amount of vinegar required.

D	C	B	A
---	---	---	---

❖ **Example 2, check**

One type of yarn costs \$4 for 100 yards. Another type of yarn costs \$5 for 150 yards. Is the relationship between the number of yards and the cost a proportional relationship between the two types of yarn? Explain.

2

- A) No; Sample answer: The ratio of the first type of yarn is 25 yards for \$1. The ratio for the second type of yarn is 30 yards for \$1. Because the ratios are not equivalent, this is not a proportional relationship.
- B) Yes; Sample answer: Both types of yarn have the exact same unit price per yard.
- C) No; Sample answer: The second type of yarn is cheaper, so they form a proportional relationship.
- D) Yes; Sample answer: The ratios are equivalent because both cost less than \$10.

D	C	B	A
---	---	---	---

❖ **Apply check:**

A basic slime recipe calls for 1 part borax, 24 parts white glue, and 48 parts water. The relationship between borax, white glue, and water is proportional. If Catalina has 3 tablespoons of borax and will use it all, how many cups of white glue will she need? (1 cup = 16 tablespoon)

3

- A) 4.5 cups
- B) 24 cups
- C) 48 cups
- D) 72 cups

D	C	B	A
---	---	---	---

❖ **Practice: (Examples 1 and 2)**

1. A salad dressing calls for 3 parts oil and 1 part vinegar. Manuela uses 2 tablespoons of vinegar and 6 tablespoons of oil to make her salad dressing.

4

- A) yes; Both have a ratio of 3 : 1.
- B) no; One ratio is 3 : 1 and the other is 6 : 2.
- C) yes; Both have equal quantities.
- D) no; The amounts are too small.

D	C	B	A
---	---	---	---

2. A specific shade of orange paint calls for 2 parts yellow and 3 parts red. Catie uses 3 cups of yellow paint and 4 cups of red paint to make orange paint.

5

- A) yes; Both have a ratio of 2 : 3.
B) no; One ratio is 2 : 3 and the other is 3 : 4.
C) yes; Both use more red than yellow.
D) no; The total amount is less than 10 cups.

D	C	B	A
---	---	---	---

3. A saltwater solution for an aquarium calls for 35 parts salt to 1000 parts water. Tareq used 7 tablespoons of salt and 200 tablespoons of water.

6

- A) no; One ratio is 35 : 1000 and the other is 1 : 200.
B) yes; Both have a ratio of 7 : 200.
C) yes; Both ratios simplify to 1 : 10.
D) no; The units must be in gallons.

D	C	B	A
---	---	---	---

4. A conveyor belt moves at a constant rate of 12 feet in 3 seconds. A second conveyor belt moves 16 feet in 4 seconds.

7

- A) no; One moves 4 feet per second and the other moves 5 feet per second.
- B) yes; Both have a ratio of 4 feet to 1 second.
- C) yes; Both move 12 feet in total.
- D) no; The times are different.

D	C	B	A
---	---	---	---

5. A tectonic plate in Earth's crust moves at a constant rate of 4 centimeters per year. In a different part of the world, another tectonic plate moves at a constant rate of 30 centimeters in ten years.

8

- A) yes; Both move at 4 cm per year.
- B) no; One ratio is 4 cm to 1 year and the other is 3 cm to 1 year.
- C) yes; Both move less than 50 cm.
- D) no; Tectonic plates do not move at constant rates.

D	C	B	A
---	---	---	---

6. A strand of hair grows at a constant rate of $\frac{1}{2}$ inch per month. A different strand of hair grows at a constant rate of 4 inches per year.

9

- A) yes; Both grow at the same rate.
- B) no; One ratio is $\frac{1}{2}$ inch per month and the other is $\frac{1}{3}$ inch per month.
- C) yes; Both grow 4 inches in a year.
- D) no; One is measured in months and the other in years.

D

C

B

A

Lesson 1-3 - Tables of Proportional Relationships

Mastering Proportional Relationships



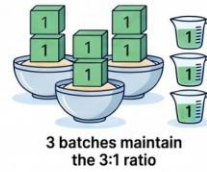
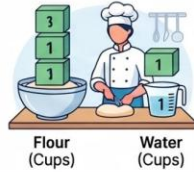
Understanding the Constant Ratio

Proportionality Requires a Constant Ratio

Two quantities are **proportional** if their **ratio remains identical** regardless of how the quantities vary.

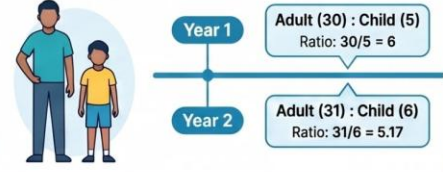
The Pizza Dough Rule

If a recipe uses 3 cups of flour for 1 cup of water, the 3:1 ratio must be maintained for any number of batches.



Why Age is Non-Proportional

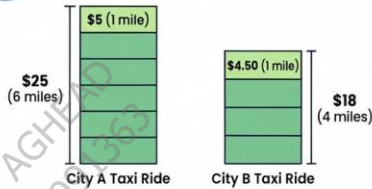
While time passes equally for two people, the ratio of their ages changes every year, making it non-proportional.



Steps to Solve Proportional Problems



1. Identify and Model the Quantities



Use bar diagrams with equal-sized sections to represent the units for each quantity in the ratio.



2. Calculate the Unit Rate

$$\text{Total Amount} \div \text{Number of Units} = \text{Unit Rate}$$

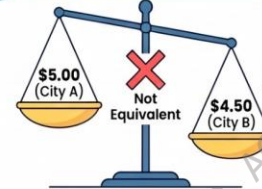
$$\text{City A: } \$25 \text{ (Total Cost)} \div 5 \text{ (Miles)} = \$5.00 \text{ per mile}$$

$$\text{City B: } \$18 \text{ (Total Cost)} \div 4 \text{ (Miles)} = \$4.50 \text{ per mile}$$

Divide the total amount by the number of units (e.g., $\$25 \div 5 \text{ miles} = \$5 \text{ per mile}$).



3. Compare and Verify



Unit Rates are different. The relationship is **NOT** proportional.

Compare unit rates; if the rates are not equivalent, the relationship is not proportional.

جداول العلاقات التناسبية: دليل الخطوات الرياضية



المقارنة وإصدار الاستنتاج

علاقة تناسبية

ثابت التناسب
(Constant of Proportionality)
النسبة الثابتة بين الكميتين،
وله نفس قيمة معدل الوحدة
في العلاقة التناسبية.

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

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

علاقة غير تناسبية

متى تكون العلاقة "غير تناسبية"؟
عندما تكون النسب بين الكميات
غير متساوية، مثل حالات
وجود رسوم ثابتة إضافية.

$$\frac{1}{2} \neq \frac{1}{3}$$

$$\frac{1}{2} \neq \frac{1}{3}$$



إيجاد معدل الوحدة (Unit Rate)

$$\frac{5 \div 5}{10 \div 5} = \frac{1}{2}$$

$$\frac{8 \div 8}{16 \div 8} = \frac{1}{2}$$

قم بتبسيط كل نسبة بحيث
يصبح مقامها يساوي (1)
لتسهيل المقارنة.



كتابة النسب لكل زوج من البيانات

$$\frac{5}{10} / \frac{5}{10}$$

$$\frac{8}{16} / \frac{8}{16}$$

قم بكتابة العلاقة بين
الكميتين في صورة نسبة.

مثال توضيحي

غير تناسبي

عدد البيئرا	التكلفة الإجمالية
1	\$9
2	\$9

\$9 (غير تناسبي)

تناسبي

عدد البيئرا	التكلفة الإجمالية
1	\$7
2	\$14

\$7 (تناسبي)

الكمية 1	الكمية 2
5	10
8	16

اختبار النسب المتكافئة
لمقارنة وإيارة وإيجاد
"معدل الوحدة" أو "ثابت
التناسب" للتفريق بين
العلاقات التناسبية وغير
التناسبية.

❖ **Example 1, check**

An adult elephant drinks about 225 liters of water each day. Is the amount of water proportional to the number of days that have passed? Use the table provided to help answer the question.

1

Time (days)	1	2	3	4
Water (L)	225	450	675	900

A) Yes; The number of days is proportional to the number of liters because the ratios are equivalent.

B) No; The ratios are different for each day.

C) No; Water consumption cannot be proportional to time.

D) Yes; The elephant drinks a constant amount only for the first two days.

D C B A

❖ **Example 2, check**

The table shows how long it took Maria to run laps around the school track. Is the number of laps she ran proportional to the time it took her? Explain.

Laps	2	4	6
Time (s)	150	320	580

2

A) no; Sample answer: The ratios of number of laps to the time are not equivalent ($\frac{2}{150} = \frac{4}{320} = \frac{6}{580}$).

B) yes; Sample answer: The ratios of number of laps to the time are equivalent.

C) no; Sample answer: The table shows that Maria ran at a perfectly constant speed.

D) yes; Sample answer: The time increases by a steady amount for each lap.

D C B A

❖ **Example 3, check**

The cost of a birthday party at a skating rink is proportional to the number of guests. The skating rink charges \$82.50 for 10 guests.

The choices show the number of guests and the total cost for four different parties that were hosted at different locations. Select each party that was hosted with the same constant of proportionality, or unit rate, as the skating rink's unit rate.

3

- ☐ 12 guests for \$99.00
- ☐ 8 guests for \$52.00
- ☐ 15 guests for \$97.50
- ☐ 6 guests for \$49.50

❖ **Example 4, check**

The tables show the amount that three friends earn during a bake sale. Write the correct unit rate that each friend earned in the spaces provided.

4

Allie

Earnings (\$)	17.00	34.00	51.00
Time (h)	1	2	3

Ben

Earnings (\$)	9.00	18.00	27.00
Time (h)	0.75	1.5	2.25

Sri

Earnings (\$)	40.00	80.00	120.00
Time (h)	2.5	5	7.5

A) Allie: \$17 per hour, Ben: \$12 per hour,
Sri: \$16 per hour

B) Allie: \$12 per hour, Ben: \$17 per hour,
Sri: \$16 per hour

C) Allie: \$17 per hour, Ben: \$16 per hour,
Sri: \$12 per hour

D) Allie: \$16 per hour, Ben: \$12 per hour,
Sri: \$17 per hour

D	C	B	A
---	---	---	---

❖ Apply Check

The table shows three membership options at a fitness center.

5

Membership	Cost
Basic	\$20 per class
Fit Plus	\$60 per month plus \$10 per class
Fit Extreme	\$75 per month plus \$30 enrollment fee

Logan chooses the membership that represents a proportional relationship between the number of classes and the monthly cost. Which membership did Logan choose? How much will he spend if he takes 12 classes in a month?

- A) Fit Plus; \$180
- B) Basic; \$240
- C) Fit Extreme; \$105
- D) Basic; \$120

D	C	B	A
---	---	---	---

❖ **Practice**

1. The cost of a school lunch is \$2.50.
(Example 1)

Lunches Bought	1	2	3	4
Total Cost (\$)	2.5	5.0	7.5	10.0

6

- A) yes; The ratios between the quantities are all equal and have a unit rate of \$2.50 per lunch.
- B) no; The ratios between the quantities are not equal.
- C) yes; The total cost is constant.
- D) no; The cost per lunch increases over time.

D	C	B	A
---	---	---	---

2. Anna walks her dog at a constant rate of 12 blocks in 8 minutes. (Example 1)

Number of Blocks	12	24	36	48
Number of Minutes	8	16	24	32

7

- A) no; The ratios are different.
- B) yes; The ratios between the quantities are all equal and have a unit rate of 1.5 blocks per minute.
- C) yes; Anna walks at a rate of 2 blocks per minute.
- D) no; The time does not change proportionally.

D	C	B	A
---	---	---	---

3. Fun Center rents popcorn machines for \$20 per hour. In addition to the hourly charge, there is a rental fee of \$35. (Example 2)

Hours	1	2	3	4	
Cost (\$)	55	75	95	115	8

- A) yes; The ratios are equivalent.
- B) yes; The cost is proportional to the hours.
- C) no; The ratios between the quantities are not equal.
- D) no; There is no hourly charge.

D	C	B	A
---	---	---	---

4. Jean has \$280 in her savings account. Starting next week, she will deposit \$30 in her account every week. (Example 2)

Weeks	1	2	3	4	
Savings (\$)	310	340	370	400	9

- A) yes; The savings are proportional to the weeks.
- B) no; The ratios between the quantities are not equal.
- C) yes; The initial amount does not affect proportionality.
- D) no; Jean is withdrawing money instead of depositing.

D	C	B	A
---	---	---	---

5. Rocko paid \$12.50 for 25 game tickets. Louisa paid \$17.50 for 35 game tickets. What is the constant of proportionality? (Example 3)

10

A	3.1
B	0.50
C	1.75
D	2.1

6. A baker, in 70 minutes, iced 40 cupcakes and, in 49 minutes, iced 28 cupcakes. What is the constant of proportionality? (Example 3)

11

A	3.1
B	0.50
C	1.75
D	2.1

7. The table shows the amount of dietary fiber in bananas. Use the table to find the constant of proportionality. (Example 4)

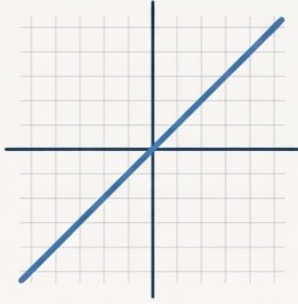
A	3.1
B	0.50
C	1.75
D	2.1

Dietary Fiber (g)	9.3	18.6	27	.9	37	.2
Bananas	3	6	9	12		

12

Lesson 1-4 - Graphs of Proportional Relationships

Mastering Graphs of Proportional Relationships



Identifying a Proportional Relationship

The Straight Line Test

The relationship is only proportional if the graph forms a perfectly straight line.

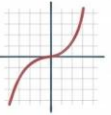
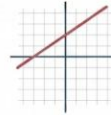
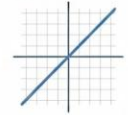
The Origin Requirement

The line must pass through the origin point (0, 0).

Proportional vs. Nonproportional

Proportional

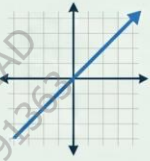
Nonproportional



Nonproportional graphs are either curved or do not start at (0, 0).

How to Analyze the Graph

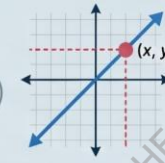
Step 1: Verify the Path



Confirm the line is straight and starts at the origin (0, 0).



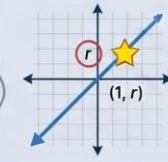
Step 2: Calculate the Constant (r)



Pick any point (x, y) and find the ratio of y divided by x ($r = y / x$).

point (4, 8)
 $r = \frac{8}{4} = 2$

Step 3: Identify the Unit Rate



Locate point (1, r); the y-value represents the unit rate.

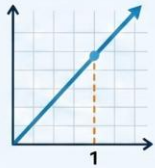
Unit Rate

Visual Comparison: Proportional vs. Nonproportional

	Proportional	Nonproportional	Nonproportional
Passes through (0, 0)?	✓	✗	✗
Graph is a straight line	✓	✗	✗
Graph is a curve	✗	✗	✓

تمثيل العلاقات التناسبية بيانياً: دليل الخطوات

القسم الثاني: تحليل النقاط وثابت التناسب



حساب ثابت التناسب (k)
اختر أي نقطة (x, y) على الخط
واحسب النسبة y مقسومة
على x لإيجاد الثابت.

(x, y)

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

دلالة النقطة (0, 0)
تعني رياضياً أنه عند وجود
صفر من الكمية x، يقابله
صفر من الكمية y.

تفسير النقطة (1, r)
تمثل القيمة r في هذه
النقطة "معدل الوحدة" أو
ثابت التناسب مباشرة.

(1, r)
r

مقارنة بين الرسوم البيانية

علاقة غير تناسبية	علاقة تناسبية
شكل الخط: منحنٍ أو منكسر	شكل الخط: مستقيم دائماً
نقطة الأصل: لا يمر بـ (0, 0)	نقطة الأصل: يمر بـ (0, 0)
النسبة ($\frac{y}{x}$): متغيرة وغير منتظمة	النسبة ($\frac{y}{x}$): ثابتة لجميع النقاط

القسم الأول: خطوات تحديد العلاقة التناسبية

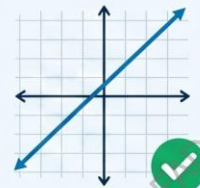
تمثيل البيانات بيانياً
ابدأ برسم النقاط المأخوذة من جدول البيانات
على المستوى الإحداثي (x, y).



اختبار "الاستقامة ونقطة الأصل"



تحديد العلاقة غير التناسبية
إذا كان الخط منحنياً أو لا يمر
بنقطة الأصل، فإن العلاقة غير
تناسبية.



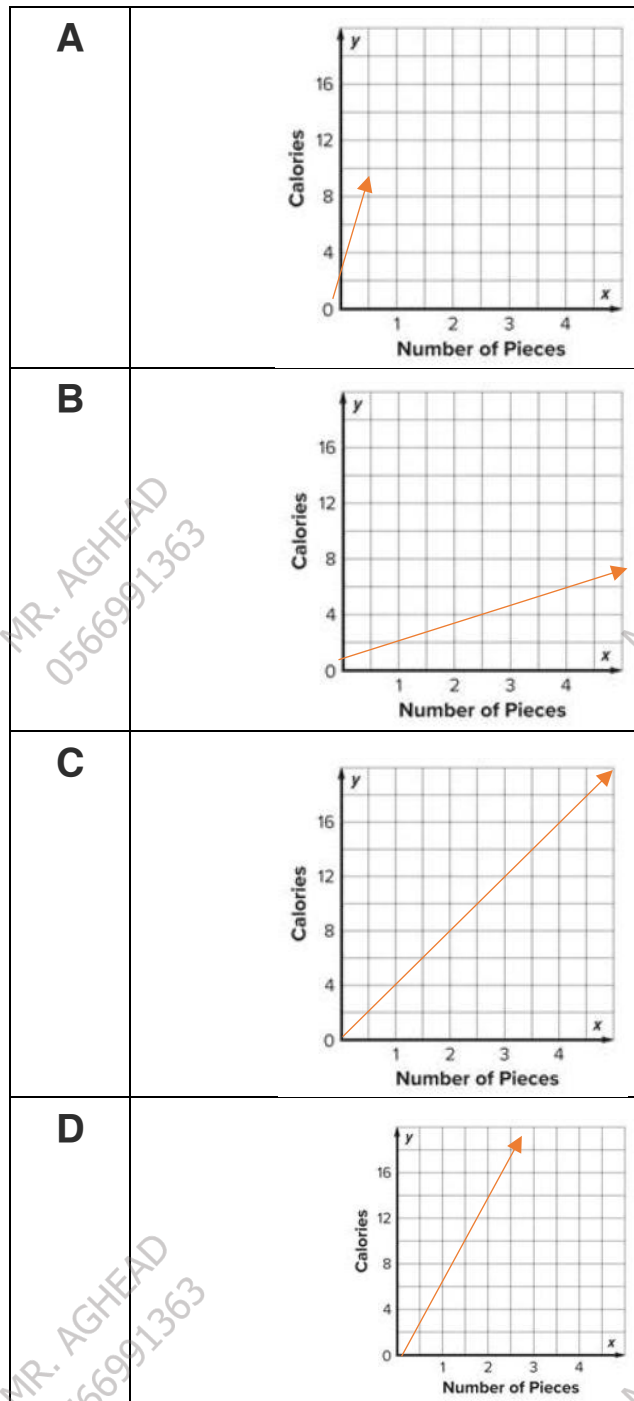
علاقة تناسبية
تكون العلاقة تناسبية فقط إذا
كان الرسم خطاً مستقيماً يمر
بالنقطة (0, 0).

❖ **Example 1, check**

In a pack of snacks, one piece has 5 Calories, two pieces have 10 Calories, and three pieces have 15 Calories.

1

Part A Graph the relationship for 0, 1, 2, and 3 pieces on the coordinate plane.



Part B Describe the relationship.

- A) The relationship is proportional because the graph of the points does form a straight line that passes through the origin.
- B) The relationship is not proportional because the line does not pass through the origin.
- C) The relationship is proportional only when there is exactly one piece of snack.
- D) The relationship is non-linear and does not form a straight line.

D	C	B	A
---	---	---	---

❖ **Example 2, check**

The table shows the account balance in a savings account at the end of each week.

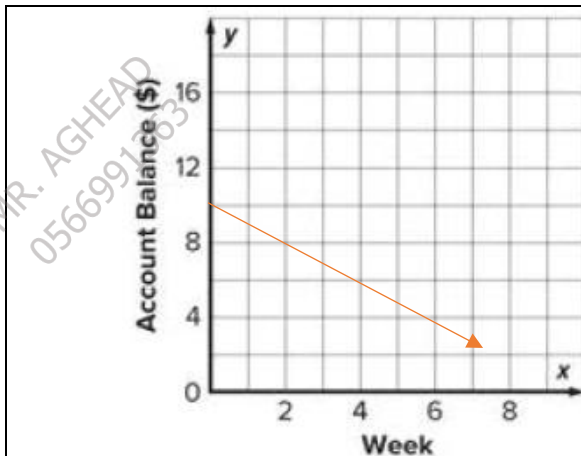
Determine if the account balance is proportional to the time by graphing the relationship on the coordinate plane.

Time (wk)	Account Balance (\$)
0	10
1	12
2	14
3	16

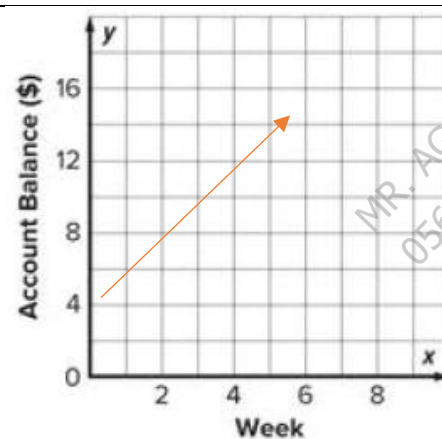
2

Part A

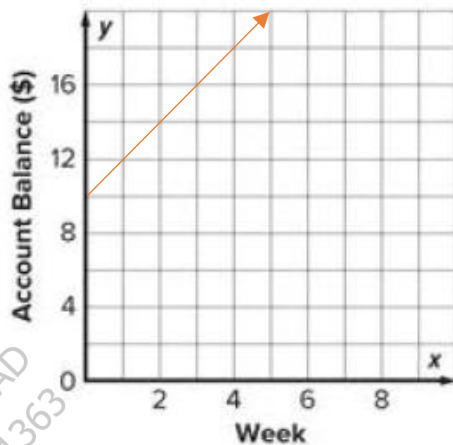
Graph the relationship.



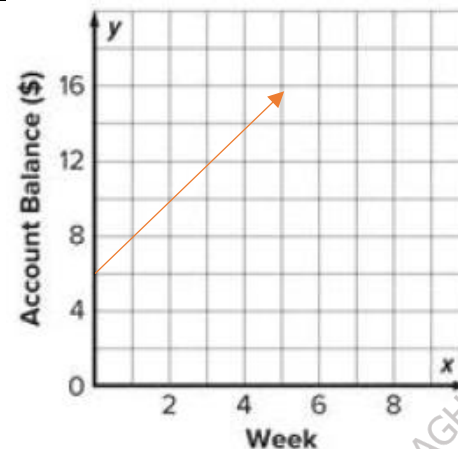
C



A



D



B

Part B

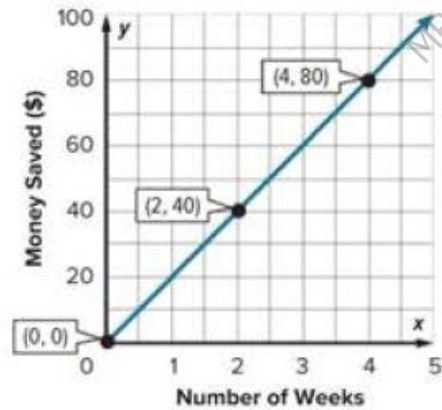
Describe the relationship.

- A) The relationship is proportional because the graph forms a straight line.
- B) The relationship is nonproportional because the graph of the points does form a straight line that does not pass through the origin.
- C) The relationship is proportional because the account balance increases by \$2 each week.
- D) The relationship is nonproportional because the points do not form a straight line.

D	C	B	A
---	---	---	---

❖ **Example 3, check**

Briana decides to save money each week for her family vacation. Use the graph to find the constant of proportionality. Then describe what it means.



3

Part A

The constant of proportionality is _____.

A	10
B	20
C	30
D	40

Part B

The constant of proportionality means that Briana saves _____ each week.

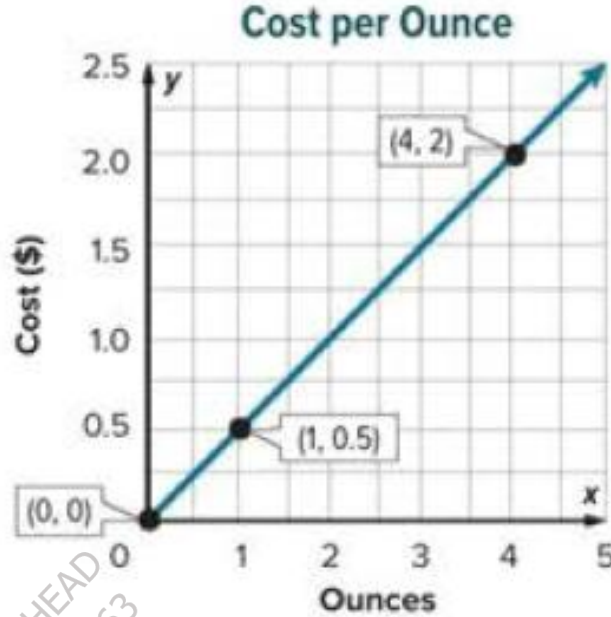
A	10
B	20
C	30
D	40

❖ Example 4, check

The cost of a smoothie is proportional to the number of ounces as shown in the graph.

Select all statements that apply.

- ☐ The unit rate is 0.
- ☐ The unit rate is 0.5.
- ☐ The unit rate is 1.
- ☐ For each smoothie, it costs \$1.50 for every 1 ounce.
- ☐ For each smoothie, it costs \$2 for every 1 ounce.
- ☐ For each smoothie, it costs \$1 for every 2 ounces.
- ☐ For each smoothie, it costs \$2.00 for every 4 ounces.



❖ **Apply Check:**

The heights of two plants are recorded after 1, 2, and 3 weeks. The data are shown in the table. Which ordered pair represents a unit rate for the number of inches grown per week?

5

Time (weeks)	Plant 1 Height (in.)	Time (weeks)	Plant 2 Height (in.)
0	0	0	0
1	5	1	3
2	6	2	6
3	7	3	9

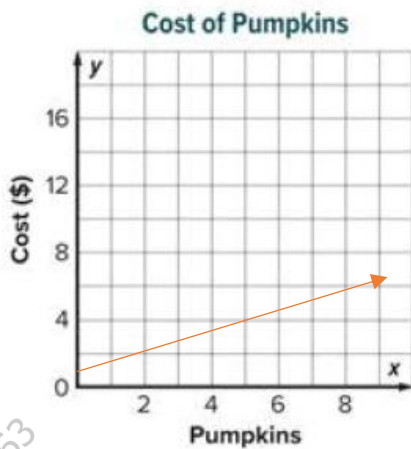
A	1
B	1,3
C	3,1
D	3

❖ Practice:

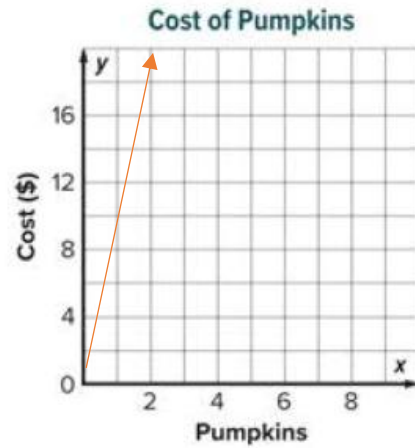
1. The cost of pumpkins is shown in the table. Determine whether the cost of a pumpkin is proportional to the number bought by graphing the relationship on the coordinate plane. Explain. (Example 1)

6

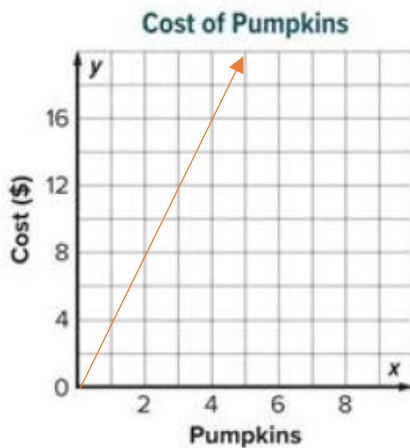
Number of Pumpkins	0	1	2	3	4
Cost (\$)	0	4	8	12	16



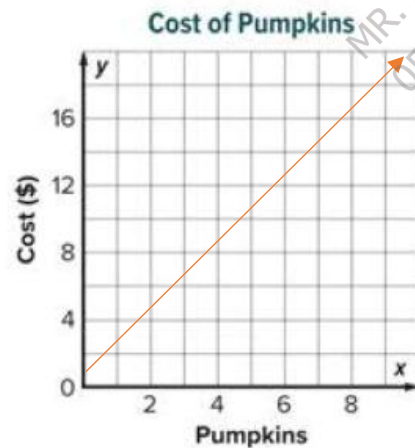
C



A



D

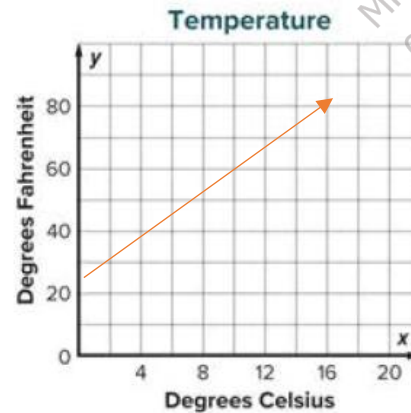
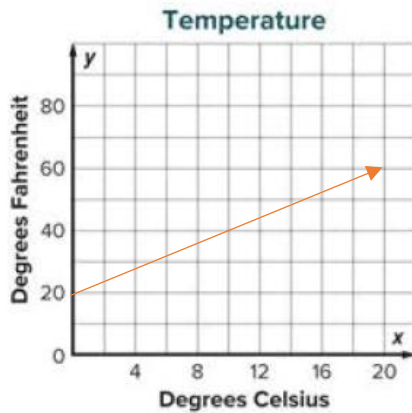
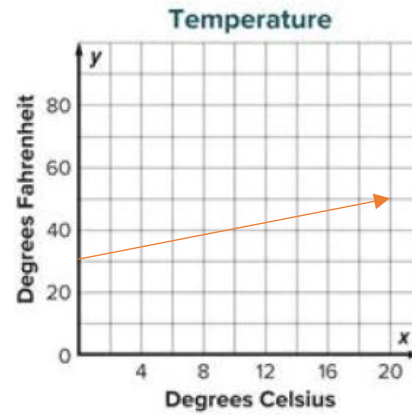
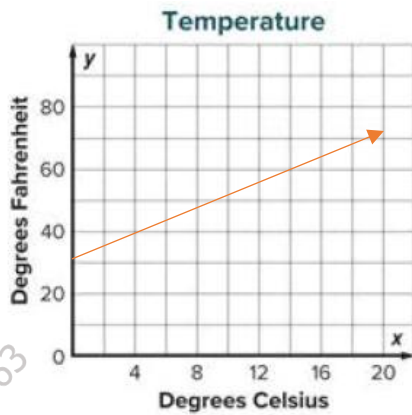


B

2. The table shows temperatures in degrees Celsius and their equivalent temperatures in degrees Fahrenheit. Determine whether the temperature in degrees Fahrenheit is proportional to the temperature in degrees Celsius by graphing the relationship on the coordinate plane. Explain. (Example 2)

7

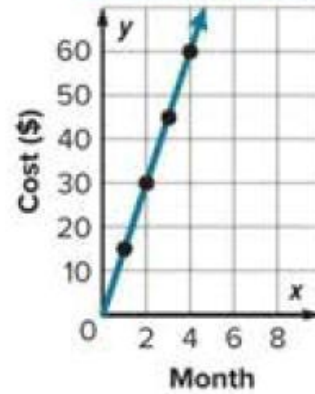
Celsius (degrees)	0	5	10	15	20
Fahrenheit (degrees)	32	41	50	59	68



3. The total cost of online streaming is proportional to the number of months. What is the constant of proportionality? (Example 3)

A	5
B	10
C	15
D	20

Online Streaming of TV Shows/Movies



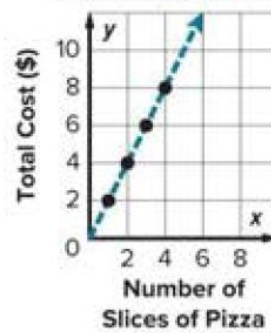
8

4. Open Response The cost per slice of pizza is proportional to the number of slices as shown in the graph. What do the points (0, 0) and (1, 2) represent? (Example 4)

- A) The point (0, 0) represents 0 slices cost \$0. The point (1, 2) represents 1 slice costs \$2.
- B) The point (0, 0) represents 1 slice costs \$0. The point (1, 2) represents 2 slices cost \$1.
- C) The point (0, 0) represents free pizza for everyone. The point (1, 2) represents the tax rate.
- D) The point (0, 0) represents the starting fee. The point (1, 2) represents the unit rate of delivery.

D	C	B	A
---	---	---	---

Pizza Slices Cost



9

Lesson 1-5 - Equations of Proportional Relationships

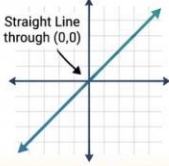
Mastering Proportional Equations: A Step-by-Step Guide

CORE CONCEPTS

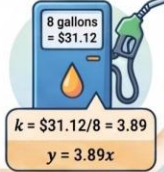
The Proportional Equation: $y = kx$



Graphing the Relationship



Real-World Application



STEP-BY-STEP SOLUTION FLOW



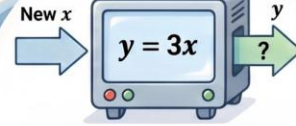
Step 2: Write the Equation

Substitute your calculated k value into the standard form equation $y = kx$.

$$k = 3 \rightarrow y = kx$$

$$y = 3x$$

Function



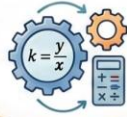
Step 3: Solve for Unknowns

Substitute a new value for x into your equation to find the missing y .

$$y = 3 \cdot 7 = 21$$

Step 1: Find the Constant (k)

Calculate the ratio of y to x using the formula $k = y/x$.



دليل حل مسائل العلاقات التناسبية

توضيح الخطوات والأساليب المختلفة لحل المسائل الرياضية التي تتضمن علاقات تناسبية بوضوح وسهولة.

القسم الثاني: خطوات الحل المنهجية

الطريقة الثالثة:
الحل بالمعادلة $y = kx$

$$y = kx$$

تعويض $x = 8$ تعويض $k = 0.75$

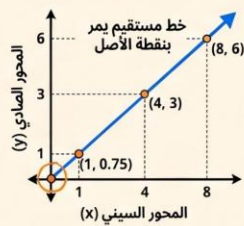
$$y = 0.75 \times 8$$

$$y = 6$$

الناتج النهائي

تعويض ثابت التناسب والقيم المعروفة في المعادلة للوصول للناتج النهائي بدقة رياضية.

الطريقة الثانية:
التمثيل البياني



رسم خط مستقيم يمر بنقطة الأصل لتحديد القيم المفقودة على المحورين.

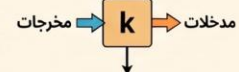
الطريقة الأولى:
استخدام جدول النسب

المتغير الأول	المتغير الثاني
3	4
0.75	1
7	8

يتم تبسيط النسبة للوصول لمعدل الوحدة، ثم ضربها في القيمة المطلوبة للقياس.

القسم الأول: الأساسيات وإيجاد معدل الوحدة

تحديد ثابت التناسب (k)



يمثل معدل الوحدة، ويُحسب بقسمة المخرجات على المدخلات لإيجاد القيمة لكل وحدة واحدة.

$$k = \frac{\text{المخرجات}}{\text{المدخلات}}$$

ما هو التناسب؟



هو معادلة رياضية توضح أن هناك نسبتين متكافئتين تمامًا في القيمة.

مقارنة تمثيلات التناسب

الطريقة	التوصيف البصري
الجدول	أعمدة توضح العلاقة بين المتغيرين (مثلاً 3 حليب : 4 دقيق)
الرسم البياني	خط مستقيم صاعد يبدأ من نقطة الصفر
المعادلة	$y = x$ صيغة جبرية مباشرة مثل $y = 0.75x$

❖ **Example 1, check**

An airplane travels 780 miles in 4 hours. The equation $y = 195x$ models this situation.

1

Part A What is the constant of proportionality?

A	190
B	195
C	185
D	199

Part B What does the constant of proportionality represent in the context of the problem?

- ☐ A An airplane travels 390 miles per hour.
- ☐ B An airplane travels 1 mile per 4 hours.
- ☐ C An airplane travels 1 mile per 585 hours.
- ☐ D An airplane travels 195 miles per hour.

❖ **Example 2, check**

A mechanic charges \$270 for 5 hours of work on a car. Write an equation that compares the total cost to the number of hours he works on a car if it is a proportional relationship.

2

A	$y = 30x$
B	$Y = 40x$
C	$Y = 54x$
D	$Y = 50x$

❖ **Example 3, check**

Jack is in charge of the 120,000-gallon community swimming pool. Each spring, he drains the pool in order to clean it. When finished, he refills the pool with fresh water. Jack can fill the pool with 500 gallons of water in 5 minutes.

3

Part A

Write an equation that represents the relationship between the total number of gallons y and the number of minutes spent filling the pool x .

A	$y = x$
B	$y = 10x$
C	$y = 1000x$
D	$y = 100x$

Part B

How long will it take to become completely filled? _____

A	1000 min
B	1100 min
C	1200 min
D	1300 min

❖ **Apply Check:**

Emily can ride her bike 15 kilometers in 45 minutes. How many more kilometers can she bike in two hours than in 45 minutes? Assume the relationship is proportional and she always bikes at the same rate.

4

A	25 km
B	30 km
C	25 m
D	25 cm

❖ **practice:**

1. Liv earns \$9.50 for every two bracelets she sells. The equation $y = 4.75x$, where x represents the number of bracelets and y represents the total cost in dollars earned, represents this situation. What is the constant of proportionality? What does the constant of proportionality represent in the context of the problem? (Example 1)

5

- A) 4.75; Liv earns \$4.75 for each bracelet she sells.
B) 9.50; Liv earns \$9.50 for each bracelet.
C) 2; Liv sells 2 bracelets per hour.
D) 4.75; Liv spends \$4.75 per bracelet.

D	C	B	A
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2. John ran 3 miles in 25.5 minutes. The equation $y = 8.5x$, where x represents the number of miles and y represents the total time in minutes, represents this situation. What is the constant of proportionality? What does the constant of proportionality represent in the context of the problem? (Example 1)

6

- A) 3; It takes John 3 minutes to run 1 mile.
B) 25.5; John runs 25.5 miles per minute.
C) 8.5; It takes John 8.5 minutes to run 1 mile.
D) 8.5; John runs 8.5 miles per minute.

D	C	B	A
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3. Lincoln bought 3 bottles of an energy drink for \$4.50. Write an equation relating the total cost y to the number of energy drinks bought x . (Example 2)

7

A	$y = 1.8x$
B	$y = 15x$
C	$y = 18x$
D	$y = 1.5x$

4. The total cost of renting a cotton candy machine for 4 hours is \$72. What equation can be used to model the total cost y for renting the cotton candy machine x hours? (Example 2)

8

A	$y = 1.8x$
B	$y = 15x$
C	$y = 18x$
D	$y = 1.5x$

5. Marley used 7 cups of water to make 4 loaves of French bread. What equation can be used to model the total cups of water needed y for making x loaves of French bread? How many cups of water do you need for 6 loaves of French bread?

9

A) $y = 1.75x; 10\frac{1}{2} \text{ c}$

B) $y = 2.25x; 12 \text{ c}$

C) $y = 1.25x; 7\frac{1}{2} \text{ c}$

D) $y = 4x; 24 \text{ c}$

D

C

B

A

6. Mrs. Henderson used $6\frac{3}{4}$ yards of fabric to make 3 elf costumes. What equation can be used to model the total number of yards of fabric y for x costumes? How many yards of fabric do you need for 7 elf costumes?

(Example 3)

10

A) $y = 2x; 14 \text{ yd}$

B) $y = 2\frac{1}{4}x; 15\frac{3}{4} \text{ yd}$

C) $y = 3\frac{1}{2}x; 24\frac{1}{2} \text{ yd}$

D) $y = 6\frac{3}{4}x; 20 \text{ yd}$

D

C

B

A

Lesson 1-6 Solve Problems Involving Proportional Relationships

MASTERING PROPORTIONAL RELATIONSHIPS

THE BUILDING BLOCKS OF PROPORTIONS



What is a Proportion?

An equation stating that two ratios are equivalent and maintain the same unit rate.

Finding the Unit Rate

Calculate the amount for every single unit (e.g., 3/4 cup of milk for 1 cup of flour).

The Equation of Proportionality

$$y = kx$$

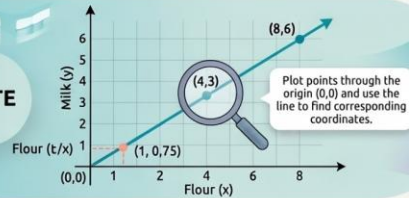
constant of proportionality or unit rate

THREE WAYS TO SOLVE (Step-by-Step)

METHOD 1: THE RATIO TABLE

Words	Ratio Table	
Milk (cups)	0.75	3
Flour (cups)	1	4
	Unit Rate	Scale back to find the unit rate, then scale forward to find the missing value.

METHOD 2: THE COORDINATE GRAPH



METHOD 3: THE ALGEBRAIC EQUATION

Substitute the unit rate for 'k' in $y = kx$ to solve for the unknown variable.

Substitute a known value to find the unknown

$$y = \frac{3}{4}x$$

Let $x = 8$ (cups of flour). Then $y = \frac{3}{4} \cdot 8$. $y = 6$ (cups of milk).

دليل معادلات العلاقات التناسبية

تعتمد العلاقات التناسبية على وجود نسبة ثابتة بين كميتين (x و y)، وتُمثل رياضياً بالمعادلة kx ، $y =$ حيث k ثابت التناسب، ويجب أن يمر تمثيلها البياني بنقطة الأصل.

خطوات حل المسائل

الخطوة 3: التنبؤ والحل



استخدم المعادلة الناتجة للتعويض عن x وإيجاد قيمة y المجهولة لأي كمية أخرى.

مثلاً: ما تكلفة 15 عبوة؟
 $y = 1.28 \times 15$

النتيجة: $y = \$19.20$

الخطوة 2: كتابة المعادلة

$$y = kx$$

استبدل قيمة k في الصيغة العامة لتصبح المعادلة جاهزة (مثلاً: $y = 1.28x$)

$$y = 1.28x$$

الخطوة 1: إيجاد ثابت التناسب (k)

احسب النسبة بين الكميتين بقسمة y على x ($k = \frac{y}{x}$)



مثال تطبيقي (شراء عبوات الزبادي):

الكمية (x)	التكلفة الإجمالية (y)	ثابت التناسب ($k = y/x$)
6 عبوات	\$7.68	\$1.28
10 عبوات	\$12.80	\$1.28



$$\frac{\$7.68}{6} = 1.28$$

$$\frac{\$12.80}{10} = 1.28$$

$$k = 1.28$$

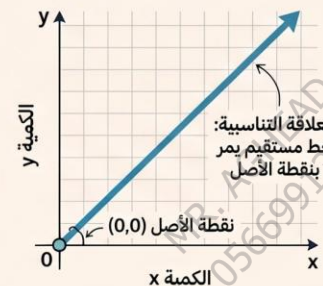
فهم الأساسيات

القاعدة الأساسية:

$$y = kx$$

كمية x
ثابت التناسب (لا يساوي صفراً)
كمية y

شرط التناسب البياني



❖ **Example 1, check**

Matthew paid \$49.45 for five used video games of equal cost. The relationship between the number of video games and the total cost is proportional. What is the total cost for 11 used video games? Use any strategy.

1

A	109
B	20.28
C	108
D	108.79

❖ **Example 2, check**

Brooke bought 8 bottled teas for \$13.52. Assume the relationship between the number of bottled teas and total cost, in dollars, is proportional. How much can Brooke expect to pay for 12 bottled teas?

2

A	109
B	20.28
C	108
D	108.79

❖ **Apply check**

The ratio of girls to boys in a school is 2 : 3. The relationship between the number of girls and the number of boys is proportional. How many boys are there if there are 345 students in the school?

3

A	200 boys
B	210 boys
C	207 boys
D	205 boys

❖ **practice:**

1. For every three girls taking classes at a martial arts school, there are 4 boys who are taking classes. If there are 236 boys taking classes, predict the number of girls taking classes at the school.

4

A	105 girls
B	6.25 girls
C	177 girls
D	75 girls

2. A grading machine can grade 96 multiple choice tests in 2 minutes. If a teacher has multiple 300 choice tests to grade, predict the number of minutes it will take the machine to grade the tests.

5

A	105 min
B	6.25 min
C	177 min
D	19.2 min

3. A 6-ounce package of fruit snacks contains 45 pieces. How many pieces would you expect in a 10-ounce package?

6

A	105 pieces
B	6.25 pieces
C	177 pieces
D	75 pieces

4. Of the 50 students in the cafeteria, 7 have red hair. If there are 750 students in the school, predict the number of students who have red hair.

7

A	105 students
B	6.25 students
C	177 students
D	75 students

5. The wait times for two different rides are shown in the table. If there are 120 people in line for the swings, how long can you expect to wait to ride the ride?

Ride	Wait Times
Carousel	6 minutes for 48 people in line
Swings	12 minutes for 75 people in line

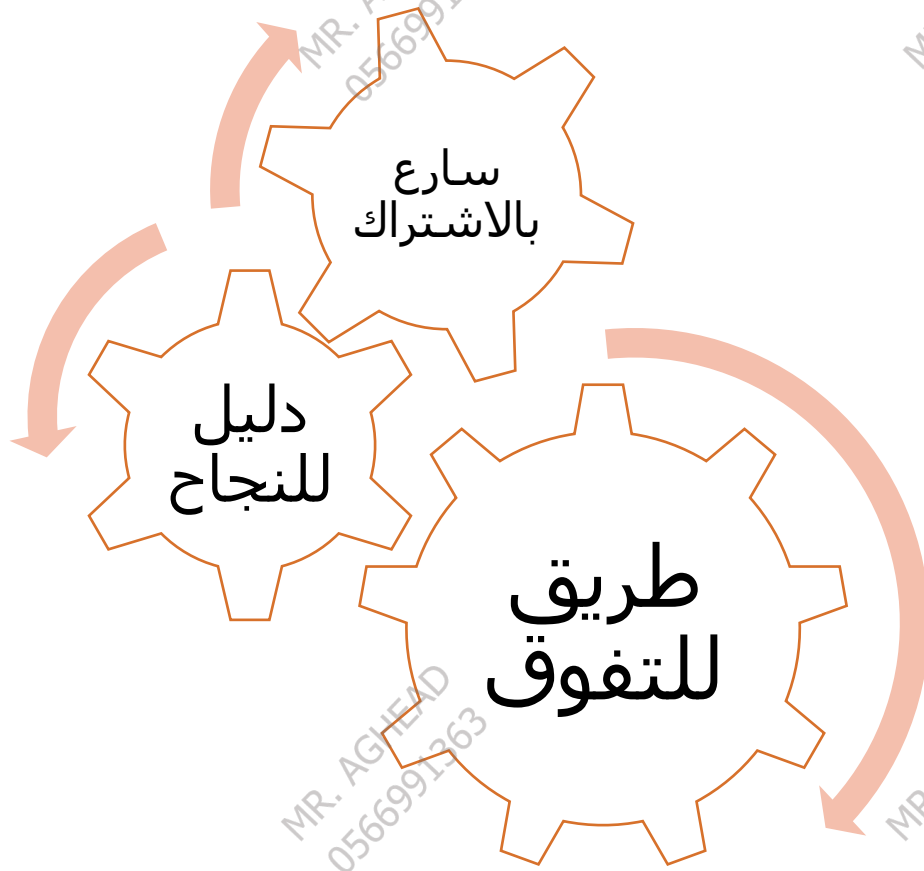
8

A	105 min
B	6.25 min
C	177 min
D	19.2 min

للتواصل اضغط الرقم:

0566991363

Mr. Ahead



للحجز التواصل عبر الـ Whatsapp من خلال الضغط على الرقم:

0566991363

مع أطيب التمنيات بالنجاح والتوفيق ...

النهاية ...