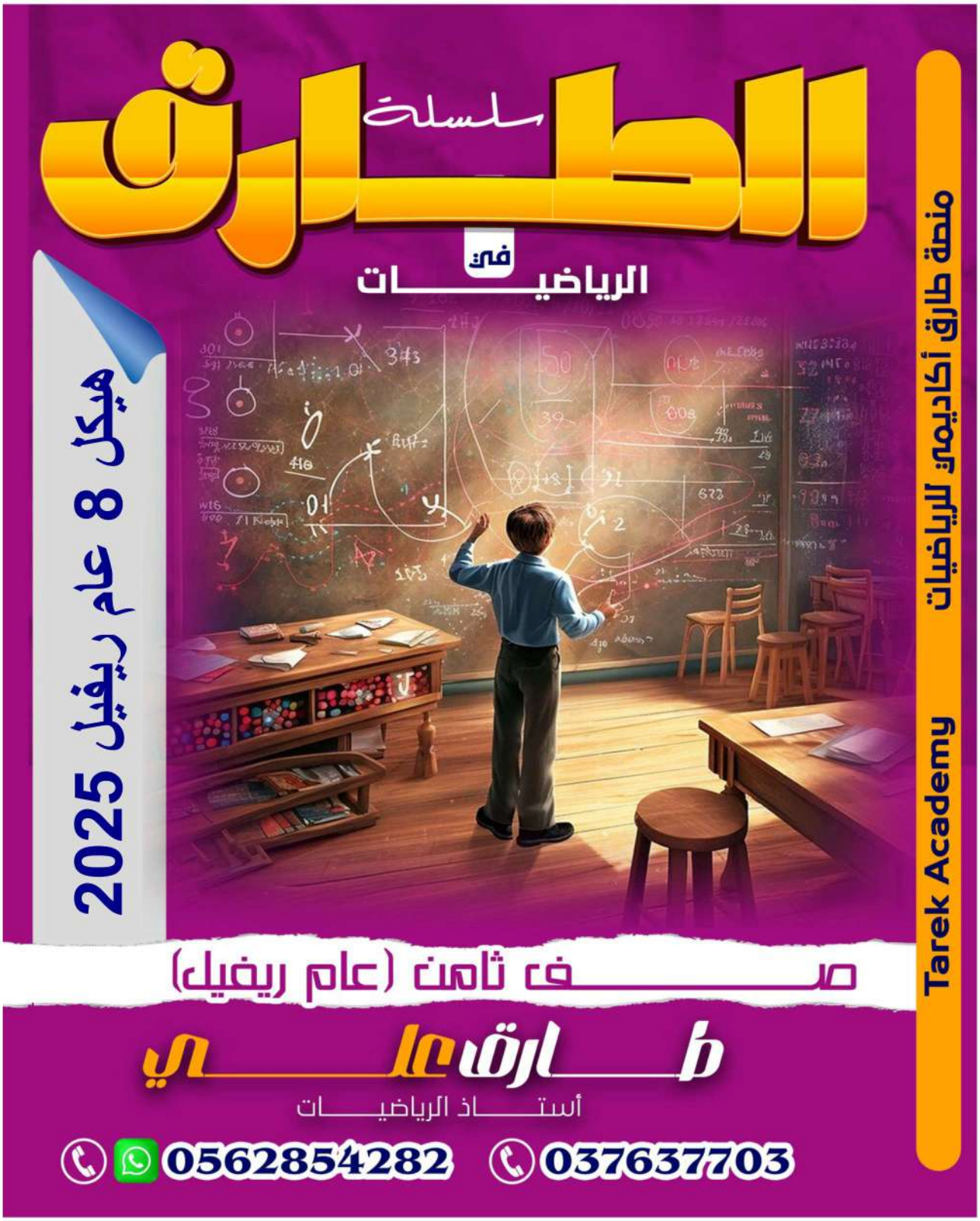
حل مراجعة وفق كامل الهيكل الوزاري الجديد منهج ريفيل المسار العام

المزيد من الملفات بحسب الصف الثامن والمادة رياضيات في الفصل الأول	
1	حل مراجعة وفق كامل الهيكل الوزاري الجديد منهج بريدج
2	حل كراسة تدريبية مراجعة وفق الهيكل الوزاري الجديد منهج بريدج
3	مراجعة وفق الهيكل الوزاري الجديد منهج ريفيل المسار المتقدم
4	تجميعة أسئلة صفحات الكتاب وفق الهيكل الوزاري الجديد منهج بريدج
5	كراسة تدريبية مراجعة وفق الهيكل الوزاري الجديد منهج بريدج


سلسلة
الطارق
في
الرياضيات
هيكل 8 عام ريفيل 2025
منصة طارق أكاديمي للرياضيات
Tarek Academy
صف ثامن (عام ريفيل)
طارق علي
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0562854282
037637703

Q1-MCQ 1-2

5. Simplify $\frac{b^{12}}{b^5}$. (Example 4)

$12-5$

b^7

A) b^2

B) b^{19}

C) b^7 ✓

D) $-b^{19}$

6. Simplify $\frac{5^5 \cdot 6^3 \cdot 8^{10}}{5^3 \cdot 6 \cdot 8^9}$. (Example 6)

$5-3$ $3-1$ $10-9$

$5^2 \cdot 6^2 \cdot 8^1$

A) $5^2 \bullet 6^4 \bullet 8^1$

B) $5^8 \bullet 6^3 \bullet 8^1$

C) $5^2 \bullet 6^3 \bullet 8^1$

D) $5^2 \bullet 6^2 \bullet 8^1$ ✓

7. A publisher sells 10^6 copies of a new science fiction book and 10^3 copies of a new mystery book. How many times as many science fiction books were sold than mystery books? (Example 5)

division

$\frac{\text{fiction}}{\text{mystery}} = \frac{10^6}{10^3}$

$6-3$

$= 10^3 = 1000$

A) 10

B) 100

C) 1000 ✓

D) 10000

8. Simplify $\frac{45x^{15}}{9x^{10}}$. (Example 7)

A) $6x^{25}$

B) $5x^{14}$

C) $6x^{25}$

D) $5x^5$

$\frac{45}{9} \cdot x^{15-10}$

$5 \quad x^5$

9. Equation Editor Simplify $\frac{a^4c^6}{a^2c}$.

A) a^2c^5

B) a^6c^3

C) a^6c^7

D) a^6c^5

$a^{4-2} \cdot c^{6-1}$

$a^2 \cdot c^5$

Q2-MCQ 1-2

Simplify each expression. (Examples 1–3)

1. $3^8 \cdot 3 =$ _____

A) 3^8

B) 3^9

C) 3^5

D) 3^2

$8+1 \quad 9$

$3 = 3$

2. $m^5 \cdot m^2 =$ _____

A) M^8

B) M^9

C) M^7

D) M^3

$5+2$

m^7

3. $3m^3n^2 \cdot 8mn^3 =$ _____

A) $2m^4n^5$

B) $4m^4n^5$

C) $11m^4n^5$

D) $24m^4n^5$

$3(8)\ m^{3+1}\ n^{2+3}$

$24\ m^4\ n^5$

4. $9p^4 \cdot (-8p^2) =$ _____

A) $-72p^2$

B) $72p^5$

C) $-p^6$

D) $-72p^6$

$9(-8)\ p^{4+2}$

$-72\ p^6$

Q3-MCQ 1-3

5. $(2m^5)^6 =$ $2^6 \quad (m^5)^6$

A) $2m^{11}$

B) $16m^{30}$

C) $2m^{30}$

D) $64m^{30}$ ✓

$64\ m^{5\times6}$

$64\ m^{30}$

6. $(7a^5b^6)^4=$ $7^4 \quad (a^5)^4 \quad (b^6)^4$

A) $243a^{15}b^{40}$

B) $625a^{15}b^{40}$

C) $2401a^{20}b^{24}$ ✓

D) $2401a^{24}b^{20}$

$2401\ a^{5\times4}\ b^{6\times4}$

$2401\ a^{20}\ b^{24}$

7. $(-3w^3z^8)^5 =$ $(-3)^5 \quad (w^3)^5 \quad (z^8)^5$ odd ←

A) $-243w^{15}z^{40}$ ✓

B) $-15w^{15}z^{40}$

C) $-243w^{40}z^{15}$

D) $243w^{15}z^{40}$

$-243\ w^{3\times5}\ z^{8\times5}$

$= -243\ w^{15}\ z^{40}$

8. $(-5r^4s^{10})^4 =$ $(-5)^4 \quad (r^4)^4 \quad (s^{10})^4$

even (+)

A) $243r^{15}s^{40}$

B) $625r^{16}s^{40}$ ✓

C) $-6251r^{16}s^{40}$

D) $625r^{40}s^{16}$

$625\ r^{4\times4} \cdot s^{10\times4}$

$625\ r^{16}\ s^{40}$

9. Which is greater: 1,000 or $(6^2)^3$? Explain.

A) 1,000

B) $(6^2)^3$ ✓

C) They are equal

D) Cannot be determined

$6^{2\times3} = 6$

$6\times6\times6\times6\times6\times6$

216×216

$= 46656$

10. Multiselect Select all of the expressions that simplify to the same expression.

- ☑ $(x^3y^4)^2$ $= x^6 y^8$ ✓
- ☐ $(x^2y)^2$ $= x^4 y^2$
- ☐ $(x^3)^2y^6$ $= x^6 y^6$
- ☑ $x^6(y^4)^2$ $= x^6 y^8$ ✓
- ☑ $(x^3)^2(y^2)^4$ $= x^6 y^8$ ✓

---

11. A square floor has a side length of $7x^5y^6$ units. A square tile has a side length of x^2y units. How many tiles will it take to cover the floor?

A) $7x^3y^5$

B) $49x^6y^{10}$

C) $49x^{10}y^{12}$

D) $7x^{10}y^{12}$

* $A = S^2 = (7x^5y^6)^2 = 7^2 x^{10} y^{12}$

$A = 49x^{10}y^{12}$

* $A_{tiles} = S^2 = (x^2y)^2 = x^4y^2$

* How many $= \dfrac{49x^{10}y^{12}}{x^4y^2}$

$= 49x^6y^{10}$

12. A cube has a side length of $3x^6$ units. A smaller cube has a side length of x^2 units. How many smaller cubes will fit in the larger cube?

A) $3x^4$

B) $27x^{12}$ ✓

C) $9x^{12}$

D) $27x^{18}$

* $V = S^3 = (3x^6)^3 = 3^3 \cdot x^{18}$

$V_{larger} = 27x^{18}$

* $V_{smaller} = S^3 = (x^2)^3 = x^6$

* $\frac{27x^{18}}{x^6} = 27x^{18-6} = 27x^{12}$

---

* Area of Square $= S^2$

* Area of Triangle $= \frac{1}{2}bh$

* Volume of Cube $= S^3$

Mr. Tarek Ali منصة طارق أكاديمي سلسلة الطارق في الرياضيات 8 GE Reveal

Q4-MCQ 1-4

Simplify each expression. (Example 1)

1. $46^0 =$ _____

A) 0 B) 1 C) 46 D) -1

2. w^0, where $w \neq 0$

A) 0 B) 1 C) W D) $-W$

Express each using a positive exponent. (Example 2)

3. $8^{-4} =$ Negative $\frac{1}{8^4}$

A) $\frac{1}{8^4}$ B) $\frac{1}{4^8}$ C) $\frac{1}{8^{-4}}$ D) $-\frac{1}{4^8}$

4. $y^{-9} =$ $\frac{1}{y^9}$

A) $\frac{1}{y^9}$ B) $\frac{1}{y^{-9}}$ C) $\frac{1}{y^{-y}}$ D) $-\frac{1}{-y^8}$

Express each fraction using a negative exponent. (Example 3)

5. $\frac{1}{d^6} =$ _____

A) $-d^{-6}$ B) d^6 C) d^{-6} D) $-d^6$

6. $\frac{1}{10^5} =$ _____

A) -10^{-6} B) 5^{10} C) 10^{-5} D) -5^{10}

Simplify each expression. (Examples 4 and 5)

7. $9^4 \cdot 9^{-6} =$ $9^{4+-6} = 9^{4-6}$

$9^{-2} = \frac{1}{9^2} = \frac{1}{81}$

A) 1/9 B) 1/81 C) 119 D) 81

8. $y^{-9} \cdot y^3 =$ $y^{-9+3} = y^{-6} = \frac{1}{y^6}$

A) $1/y^6$ B) $1/-y^6$ C) $-1/y^6$ D) $1/y^{-6}$

9. $\frac{x^{-8}}{x^{-12}} =$ $-8 - -12$

x

$-8 + 12$ 4

$x = x$

A) x^{-4}

B) x^4

C) $-x^4$

D) x^{-6}

10. $\frac{d^{-13}}{d^{-2}} =$ $-13 - -2$

d

$-13 + 2$

d

d^{-11}

A) d^{-15}

B) d^{15}

C) $-d^4$

D) d^{-11}

Q5-MCQ 1-5

Write each number in standard form.

1. 1.6×10^3

A) 160

B) 1,600 $= 1.6 \times 10^3$

C) 16,000

D) 0.0016

---

2. 1.49×10^{-7} → Negative Power (Point)

A) 0.000000149

B) 0.0000149

C) 149,000,000

D) 14,900,000

0.000 000 149

---

3. 8.3E–6 E → 10

A) 0.000083

B) 0.0000083 $8.3 \times 10^{-6} =$

C) 8,300,000

D) 830,000 0.000 0083

4. $7E11$

7×10^{11}

A) 7,000,000,000

B) 700,000,000,000

C) 0.00000000007

D) 0.0000000007

---

5. $2,204,000,000$

2.204×10^{9}

A) 2.204×10^{9}

B) 2.204×10^{6}

C) 2.204×10^{-9}

D) 2.204×10^{-6}

---

6. 0.0000000642

6.42×10^{-8}

Point → Negative Power

A) 6.42×10^{-8}

B) 6.42×10^{8}

C) 6.42×10^{-7}

D) 6.42×10^{7}

Q6-MCQ 2-1

Write each rational number in decimal form. Then determine whether the decimal is a terminating decimal. (Examples 1 and 2)

1. $-\frac{11}{16} =$

a) $-9.3\overline{6}$

b) -0.6875

c) 4.375

d) $0.\overline{15}$

Terminating

2. $\frac{5}{33} =$

a) $-9.3\overline{6}$

b) -0.6875

c) 4.375

d) $0.\overline{15}$

$\frac{15}{99}$ $0.\overline{15}$ Not Terminating

3. $4\frac{3}{8} =$

a) $-9.3\dot{6}$

b) -0.6875

c) 4.375

d) $0.\overline{15}$

$4\frac{375}{1000}$ 4.375 Terminating

4. $-9\frac{11}{30} =$

a) $-9.3\dot{6}$

b) -0.6875

c) 4.375

d) $0.\overline{15}$

$-9.3\overline{6}$

Q7-MCQ 2-1

Write each decimal as a fraction or mixed number in simplest form. (Examples 3 and 4)

5. $0.\overline{8} =$ ______ $\frac{8}{9}$

a) $-2/11$

b) $8/9$ ✓

c) $4\frac{5}{11}$

d) $-1\frac{5}{9}$

6. $-0.\overline{18} =$ ______ $-\frac{18}{99} = -\frac{9\times 2}{9\times 11} = -\frac{2}{11}$

a) $-2/11$ ✓

b) $8/9$

c) $4\frac{5}{11}$

d) $-1\frac{5}{9}$

7. $-1.\overline{5} =$ ______ $-1\frac{5}{9}$

a) $-2/11$

b) $8/9$

c) $4\frac{5}{11}$

d) $-1\frac{5}{9}$ ✓

8. $4.\overline{45} =$ ______ $4\frac{45}{99} = 4\frac{9\times 5}{9\times 11} = 4\frac{5}{11}$

a) $-2/11$

b) $8/9$

c) $4\frac{5}{11}$ ✓

d) $-1\frac{5}{9}$

Q8-MCQ 2-2

Simplify using rational numbers. If the expression cannot be simplified, explain why. (

1. $\sqrt{361} =$ _____

a) 19
b) $-3/4$
c) ± 1.4
d) Can not be simplified

2. $\pm\sqrt{1.96} =$ _____

a) 19
b) $-3/4$
c) ± 1.4
d) Can not be simplified

3. $-\sqrt{\frac{9}{16}} =$ _____

a) 19
b) $-3/4$
c) ± 1.4
d) Can not be simplified

4. $\sqrt{-441} =$ _____

a) 19
b) $-3/4$
c) ± 1.4
d) Can not be simplified

5. Solve $m^2 = 0.04$. (Example 5) _____

a) 7
b) -8
c) ± 0.2
d) 4.5

$m^2 = \frac{4}{100}$

$m = \pm\sqrt{\frac{4}{100}} = \pm\frac{2}{10}$

$= \pm 0.2$

Simplify using rational numbers. (Examples 6 and 7)

6. $\sqrt[3]{343} =$ _____

a) 7
b) -8
c) ± 0.2
d) 4.5

Same $\sqrt[3]{}$ Sign

7. $\sqrt[3]{-512} =$ _____

a) 7
b) -8
c) ± 0.2
d) 4.5

Q9-MCQ 2-2

8. A basin of a water fountain is cube shaped and has a volume of 91.125 cubic feet. Solve $s^3 = 91.125$ to find the length s of one side of the basin. (Example 8)

a) -0.3

b) 14

c) 4.5 ✓

d) $0.\overline{15}$

$S = \sqrt[3]{91.125}$

$4.5 \times 4.5 \times 4.5$

45
× 45
225
+ 1800
2025
× 45
10125
+ 81000
91125

---

9. Moesha has 196 pepper plants that she wants to plant in a square formation. How many pepper plants should she plant in each row?

$\sqrt{196} \Rightarrow 14 \times 14 = 196$

a) 12

b) 14 ✓

c) 13

d) 15

10. Equation Editor What is the value of p in the equation shown?

$p^3 = -0.027$

$P = \sqrt[3]{-0.027}$

$-0.3 \times -0.3 \times -0.3$

-0.027

a) -0.3

b) 14

c) 4.5

d) $0.\overline{15}$

Q10-MCQ 2-4

Estimate each square root or cube root to the nearest integer.

1. $\sqrt{125} \approx$ ____

$11^2 = 121 \quad \approx 125$

$12^2 = 144$

- A. 11
- B. 12
- C. 13
- D. 10

---

2. $\sqrt{55} \approx$ ____

$8^2 = 64$

$7^2 = 49$

- A. 8
- B. 7
- C. 6
- D. 9

3. $\sqrt[3]{70} \approx$ _____

- A. 5
- B. 4
- C. 6
- D. 3

$5^3 = 5 \times 5 \times 5 = 125$

$4 \times 4 \times 4 = 64$ ✓

$6 \times 6 \times 6 = 216$

$3 \times 3 \times 3 = 27$

---

4. $\sqrt[3]{923} \approx$ _____

- A. 9
- B. 10
- C. 8
- D. 11

$10 \times 10 \times 10 = 1000 \approx 923$

Estimate each square root to the nearest tenth.

5. $\sqrt{296} \approx$ _____

- A. 17.3
- B. 17.1
- C. 17.2
- D. 17.0

≈ 296

$$\begin{array}{r} 17.2 \\ \times\ 17.2 \\ \hline 344 \\ 12040 \\ +\ 17200 \\ \hline 295.84 \end{array}$$

6. $\sqrt{5} \approx$ _____

- A. 2.1
- B. 2.3
- C. 2.2
- D. 2.4

$$\begin{array}{r} 2.2 \\ \times\ 2.2 \\ \hline HH \\ +\ HH0 \\ \hline 4.8H \end{array}$$

---

7. $\sqrt{11} \approx$ _____

- A. 3.4
- B. 3.2
- C. 3.3
- D. 3.5

$$\begin{array}{r} 3.3 \\ \times\ 3.3 \\ \hline 1\,09 \\ +\ 990 \\ \hline 10.89 \end{array}$$

---

8. $\sqrt{62} \approx$ _____

- A. 7.8
- B. 7.9
- C. 7.7
- D. 8.0

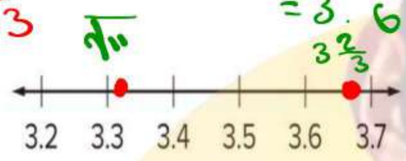
$$\begin{array}{r} 7.9^{8} \\ \times\ 7.9 \\ \hline 711 \\ +\ 5530 \\ \hline 62.41 \end{array}$$

Q11-MCQ 2-5

Complete each statement using <, >, or =. Then graph the numbers on the number line. (Examples 1 and 2)

1. $\sqrt{11}$ __<__ $3\frac{2}{3}$

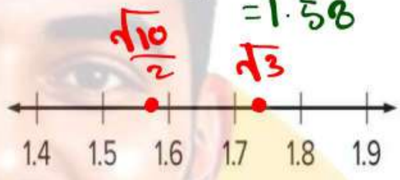
$3\frac{2 \times 3}{3 \times 3} = 3\frac{6}{9} = 3.6$; $\sqrt{11} \approx 3.3$



A. >
B. < ✓
C. =

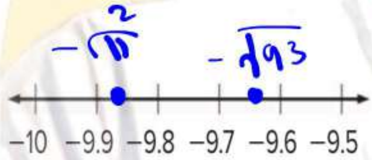
2. $\sqrt{3}$ __>__ $\frac{\sqrt{10}}{2}$

$\sqrt{3} = 1.73$; $\frac{\sqrt{10}}{2} = \frac{3.16}{2} = 1.58$



A. > ✓
B. <
C. =

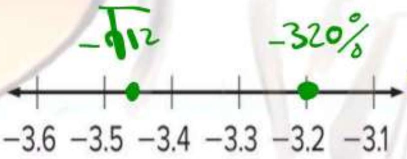
3. $-\pi^2$ __<__ $-\sqrt{93}$ $= -9.64$



$-(3.14)^2 = -9.8596 \simeq -9.86$

A. >
B. < ✓
C. =

4. $-\sqrt{12}$ __<__ -320%



$-\sqrt{12} = -3.46$

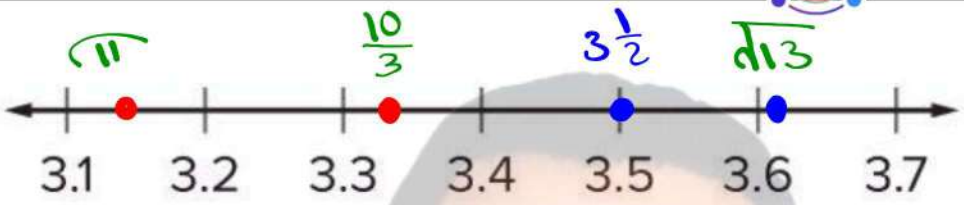
$-\frac{320}{100} = -3.2$

A. >
B. < ✓
C. =

5. Order the set $\left\{3\frac{1}{2}, \frac{10}{3}, \pi, \sqrt{13}\right\}$ from least to greatest. Then graph the set on the number line. (Example 3)

* $3\frac{1}{2} = 3.50 \rightarrow$ ③
* $\frac{10}{3} = 3\frac{1}{3} = 3.33 \rightarrow$ ②
* $\pi = 3.14 \rightarrow$ ①
* $\sqrt{13} = 3.61 \rightarrow$ ④

A. $\frac{10}{3}, \pi, 3\frac{1}{2}, \sqrt{13}$
B. $\pi, \frac{10}{3}, 3\frac{1}{2}, \sqrt{13}$ ✓
C. $\pi, 3\frac{1}{2}, \frac{10}{3}, \sqrt{13}$
D. $\sqrt{13}, 3\frac{1}{2}, \frac{10}{3}, \pi$



6. The table shows the foul-shot statistics for three players in a recent basketball game. Which player had the greatest foul-shot statistic? (Example 4)

Player	Foul-Shot Statistic
1	$\frac{7}{9} = 0.\overline{7} = 0.77$
2	$72\% = \frac{72}{100} = 0.72$
3	8 out of 10 $= \frac{8}{10} = 0.80$

A. Player 1

B. Player 2

C. Player 3 ✓

7. **Multiple Choice** Select the symbol that makes the sentence true.

$\sqrt{27} \geq \frac{\sqrt{95}}{2}$

* $\sqrt{27} \approx 5.20$

* $\frac{\sqrt{95}}{2} = \frac{9.75}{2} = 4.88$

(A) <

(B) > ✗

(C) =

(D) ≤

$5.20 > 4.88$

Q12-MCQ 3-2

Write and solve an equation for each exercise. Check your solution.

(Examples 1 and 2) every - each - Per → variable

1. Marko has 45 comic books in his collection, and Tamara has 61 comic books. Marko buys 4 new comic books each month and Tamara buys 2 comic books each month. After how many months will Marko and Tamara have the same number of comic books?

A) 40

B) 5

✓ C) 8

D) 3

$45 + 4m = 61 + 2m$

$4m - 2m = 61 - 45$

$2m = 16 \quad m = \frac{16}{2} = 8$

---

2. A fish tank has 150 gallons of water and is being drained (−) at a rate of $\frac{1}{2}$ gallon each second. A second fish tank has 120 gallons of water and is being filled (+) at a rate of $\frac{1}{4}$ gallon each second. After how many seconds will the two fish tanks have the same amount of water?

~~A)~~ 40

B) 5

C) 8

D) 3

$150 - \frac{1}{2}S = 120 + \frac{1}{4}S$

$150 - 120 = \frac{1}{4}S + \frac{1}{2}S$

$30 = \frac{3}{4}S$

$S = 30 \times \frac{4}{3} = 10 \times 4 = 40$

3. Shipping Company A charges $14 plus $2.25 a pound to ship overnight packages. Shipping Company B charges $20 plus $1.50 a pound to ship an overnight package. For what weight is the charge the same for the two companies?

A) 40

B) 5

C) 8 ✓

D) 3

$14 + 2.25p = 20 + 1.50p$

$2.25p - 1.50p = 20 - 14$

$0.75p = 6$

$\frac{3}{4}p = 6 \rightarrow p = 6 \times \frac{4}{3}$

$p = 2 \times 4 = \boxed{8}$

---

4. A bicycle rental company charges a $20 fee plus $5.50 per hour to rent a bicycle. Another bicycle rental company charges a $15 fee plus $6.50 per hour to rent a bicycle. For what number of hours is the cost for the rental the same?

A) 40

B) 5 ✓

C) 8

D) 3

$20 + 5.50h = 15 + 6.50h$

$20 - 15 = 6.50h - 5.50h$

$5 = h$

Q13-MCQ 3-3

Solve each equation. Check your solution. (Examples 1–3)

1. $-g + 2(3 + g) = -4(g + 1)$

$-g + 6 + 2g = -4g - 4$

$-g + 2g + 4g = -6 - 4$

$\frac{5g}{5} = \frac{-10}{5} \rightarrow g = -2$

A) 4.5

B) 10

C) −2 ✓

D) 1.5

---

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

$-8 - x = -6x + 12 + 3x$

$-x + 6x - 3x = 12 + 8$

$\frac{2x}{2} = \frac{20}{2}$

$x = 10$

A) 4.5

B) 10 ✓

C) −2

D) 1.5

3. $0.6(4-2x)=20.5-(3x+10)$

A) 4.5

B) 1.5

C) -5

D) 4

$2.4-1.2x=20.5-3x-10$

$3x-1.2x=20.5-10-2.4$

$1.8x=8.1$

$x=\frac{81}{18}=\frac{9}{2}=4.5$

4. $12-(4y+8)=0.5(8y-16)$

A) 4.5

B) 1.5

C) -5

D) 4

$12-4y-8=4y-8$

$12-8+8=4y+4y$

$12=8y$

$y=\frac{12}{8}=\frac{3}{2}=1.5$

5. $\frac{1}{2}(-4+6n)=\frac{1}{3}n+\frac{2}{3}(n+9)$

A) 4.5

B) 1.5

C) -5

D) 4

$-2+3n=\frac{1}{3}n+\frac{2}{3}n+6$

$3n-n=6+2$

$2n=8$

$n=\frac{8}{2}=4$

6. $\frac{1}{5}(5x-5)+3x=-9\left(\frac{1}{3}x+4\right)$

A) 4.5

B) 1.5

C) -5

D) 4

$x-1+3x=-3x-36$

$x+3x+3x=-36+1$

$7x=-35$

$x=\frac{-35}{7}=-5$

Q14-MCQ 3-4

Write and solve an equation for each exercise. Check your solution.

(Examples 1 and 2)

1. Mr. Reed is drawing a blueprint of a rectangular patio. The width of the patio is $40\frac{3}{4}$ feet shorter than twice its length. The perimeter of the patio is $86\frac{1}{2}$ feet. What is the length of the patio?

a. 9

b. 30.75

c. 9.25

d. 28 ✓

$P = 2(\ell + w)$

$P = 2(\ell + 2\ell - 40.75)$

$\frac{86.5}{2} = \frac{2(3\ell - 40.75)}{2}$

$43.25 = 3\ell - 40.75$

$43.25 + 40.75 = 3\ell$

$\frac{84}{3} = \frac{3\ell}{3}$

$\ell = 28$

2. The Yearbook Club is going to an amusement park, and each of their 12 members will pay for admission and will also help pay for parking. The Robotics Club is going to a waterpark, and each of their 14 members will pay for admission and will also purchase a meal ticket. Admission to the amusement park is 1.5 times that of the waterpark's admission, as shown in the table. If the total cost is the same at both the amusement park and the waterpark, what is the admission per student to the waterpark?

Amusement Park	Waterpark
Admission: \$1.5x per student	Admission: \$$x$ per student
Parking: \$2 per student	Meal Ticket: \$10.50 per student

$a.9$

$b.30.75$

$c.9.25$

$d.28$

$\div 2$

$\cancel{12}^{6}(1.5x+2) = \overset{\div 2}{\cancel{14}^{7}}(x+10.5)$

$9x+12 = 7x+73.5$

$9x-7x = 73.5-12$

$\frac{2x}{2} = \frac{61.5}{2}$

$x = 30.75$

3. **Open Response** Arjun purchased 5 tickets to a play, each with the same price. He was also charged an online service fee of $3.50 per ticket. Emilia purchased 3 tickets to the same play and paid twice as much for her tickets as Arjun. Emilia was also charged a service fee of $2.75 per ticket. If they spent the same amount, what is the cost of each of the tickets Arjun purchased? Let t represent the cost of each of Arjun's tickets.

Equation: $5(t+3.5) = 3(2t+2.75)$

Cost of a Ticket: $5t + 17.50 = 6t + 8.25$

$17.50 - 8.25 = 6t - 5t$

$9.25 = t$

$a.9$

$b.30.75$

$c.9.25$

$d.28$

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Q15-MCQ 3-5

Solve each equation. Determine whether the equation has one solution, no solution, or infinitely many solutions. (Examples 1 and 2)

1. $4(x - 8) + 12 = 2(2x - 9)$

A) No solution ✓
B) Infinitely many solution
C) 3
D) 5

$4x - 32 + 12 = 4x - 18$

$4x - 4x = 32 - 12 - 18$

$0 \neq 2$ different

2. $3(2k - 5) = 6(k - 4) + 9$

A) No solution
B) Infinitely many solution ✓
C) 3
D) 5

$6k - 15 = 6k - 24 + 9$

$6k - 6k = 15 - 24 + 9$

$0 = 0$ ✓ Same

3. $-4y - 3 = \frac{1}{3}(12y - 9) - 8y$

A) No solution
B) Infinitely many solution ✓
C) 3
D) 5

$-4y - 3 = 4y - 3 - 8y$

$-3 + 3 = 4y + 4y - 8y$

$0 = 0$ ✓

4. $6(3 - 5w) = 5(4 - 2w) - 20w$

A) No solution ✓
B) Infinitely many solution
C) 3
D) 5

$18 - 30w = 20 - 10w - 20w$

$18 - 20 = 30w - 10w - 20w$

$-2 \neq 0$

Complete each equation so that it has infinitely many solutions. (Example 3) Same

5. $2x - 7(x + 10) = \boxed{-5}x - \boxed{70}$

$2x - 7x - 70 = -5x - 70$

6. $12x - x + 8 + 3x = \boxed{14}x + \boxed{8}$

$14x + 8$

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* $\frac{x}{N}$ Same different.

Complete each equation so that it has no solution. (Example 4)

7. $-15x + 4x + 2 - x = \boxed{-12}x + \boxed{6}$

$-12x + 2$

8. $9(x - 4) - 5x = \boxed{4}x - \boxed{10}$

$9x - 36 - 5x$

$= 4x - 36$

Test Practice

9. **Multiple Choice** Which of the following explains why $\frac{2}{3}(x + 3) = \frac{2}{3}(x - 6)$ has no solution?

(A) The coefficients are different, and the constants are different.

(B) The coefficients are the same, and the constants are the same.

(C) The coefficients are different, and the constants are the same.

(D) The coefficients are the same, and the constants are different.

Q16-MCQ 4-2

1. The graph shows the depth in feet of snow after each two-hour period during a snowstorm. Find the slope of the line. (Example 1)

a. -1

b. $-4/3$

c. 0.25

d. -20

$(2, 0.5)$ $(4, 1)$

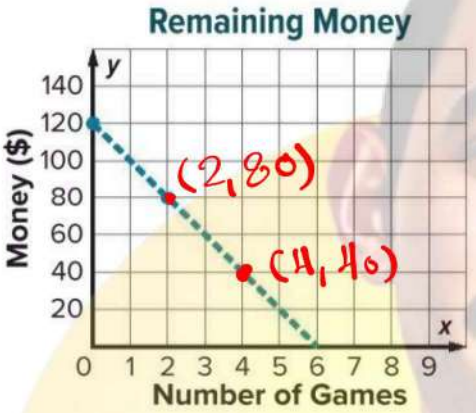
$m = \frac{y_2 - y_1}{x_2 - x_1}$ Slope

$m = \frac{1 - 0.5}{4 - 2}$

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

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

2. The graph shows the amount of money left after buying video games. Find the slope of the line. (Example 2)



a. -1
b. $-4/3$
c. 0.25
d. -20

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{80 - 40}{2 - 4}$

$m = \frac{40}{-2} = -20$

---

3. The points given in the table lie on a line. Find the slope of the line. (Example 3)

x	-1	2	5	8
y	3	-1	-5	-9

(x, y)

$(-1, 3)$ $(2, -1)$

a. -1
b. $-4/3$
c. 0.25
d. -20

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - -1}{-1 - 2} = \frac{4}{-3}$

Find the slope of the line that passes through each pair of points. (Examples 4–6)

4. $M(3, 5)$, $N(2, 6)$

a. -1
b. $-4/3$
c. 0.25
d. -20

$m = \frac{6 - 5}{2 - 3} = \frac{1}{-1}$

$= |-1|$

5. $G(-3, 2), H(7, 2)$

$m = \frac{2-2}{7--3} = \frac{0}{10}$

$m = 0$

a. -1

b. *undefined*

c. 0.25

d. 0

---

6. $E(6, 8), F(6, -2)$

$m = \frac{8--2}{6-6}$

$m = \frac{10}{0}$

a. -1

b. *undefined*

c. 0.25

d. 0

---

7. Multiple Choice The points given in each table lie on lines. Which table, when graphed, would show a negative slope?

(A)

x	-2	3	8	13
y	-2	-1	0	1

(B)

x	-1	1	3	5
y	-2	0	2	4

(C)

x	3	5	6	8
y	8	0	-4	-12

(D)

x	-13	-9	-5	-1
y	-4	-2	0	2

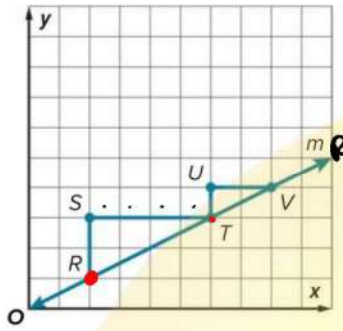
A. $m = \frac{-2--1}{-2-3} = \frac{-1}{-5} = \frac{1}{5}$

C. $m = \frac{8-0}{3-5} = \frac{8}{-2} = -4$

m = − m = +

Q17-MCQ 4-3

1. The graph of line *m* is shown. Use the similar slope triangles to compare the slope of segment *RT* and *TV*. (Example 1)



a. more

b. =

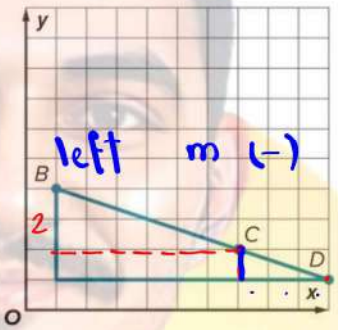
c. less

$m_{RT} = \frac{\text{rise}}{\text{run}} = \frac{\text{Vertical}}{\text{Horizontal}}$

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

$m_{TV} = \frac{1}{2}$ Same

2. The plans for a zipline are shown. Use two points to determine the slope of the zipline. Then verify that the slope is the same by choosing a different set of points. (Example 2)



left m (−)

a. more

b. =

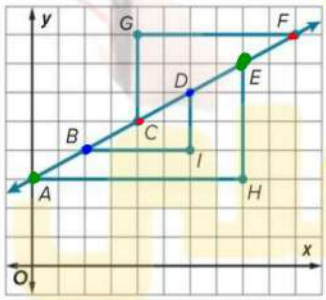
c. less

$m_{CD} = -\frac{1}{3}$

$m_{BC} = \frac{-2 \div 2}{6 \div 2} = \frac{-1}{3}$

Same

3. Name the slope triangles shown in the graph. What is the slope of the line?



R (+)

a. more

b. =

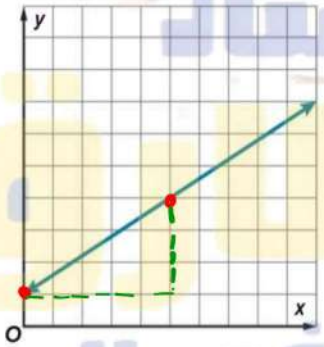
c. less

$m_{BD} = \frac{2}{4} = \frac{1}{2}$

$m_{AE} = \frac{4}{8} = \frac{1}{2}$

$m_{CF} = \frac{3}{6} = \frac{1}{2}$

4. Draw two slope triangles on the line. Determine the slope of the line.



a. 3

b. 1 / 2

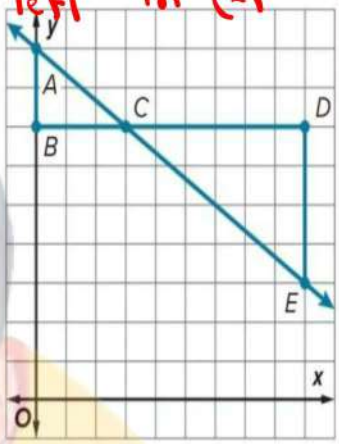
c. 3 / 5

d. 0

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

left m (-)

5. **Multiselect** The graph shows similar slope triangles on a line. Select all of the statements that are true.



A The slope of the line is negative.

B The slopes of each triangle are the same because they lie on the same line.

C Triangle *CDE* has a greater slope because the triangle is larger.

D The slope of each triangle is $\frac{2}{3}$.

E The slope of the line is positive.

y alone

Q18-MCQ 4-5

$y = mx + b$

Identify the slope and y-intercept of the graph of each equation.

* m → slope
* b → y-intercept

1. $y = \frac{1}{2}x - 5$

A) slope = 2, y-intercept = -5

B) slope = $\frac{1}{2}$, y-intercept = -5

C) slope = -5, y-intercept = $\frac{1}{2}$

D) slope = $\frac{1}{2}$, y-intercept = 5

---

2. $y = 3x - 1$

A) slope = -1, y-intercept = 3

B) slope = 3, y-intercept = -1

C) slope = 3, y-intercept = 1

D) slope = 1, y-intercept = -3

Write the equation of a line in slope-intercept form with each slope and y-intercept.

3. slope = $-\frac{1}{3}$ (m), y-intercept = 4 (b) → $y = mx + b$, y alone

A) $y = 4x - \frac{1}{3}$

B) $y = -\frac{1}{3}x + 4$ → $y = -\frac{1}{3}x + 4$

C) $y = \frac{1}{3}x - 4$

D) $y = -3x + 4$

4. slope = $\frac{3}{2}$, y-intercept = -3

A) $y = \frac{3}{2}x - 3$

B) $y = -3x + \frac{3}{2}$

C) $y = \frac{2}{3}x + 3$

D) $y = -\frac{3}{2}x - 3$

$y = \frac{2}{3}x - 3$

---

5. slope = 4, y-intercept = -2

A) $y = -2x + 4$

B) $y = 4x - 2$

C) $y = 2x - 4$

D) $y = -4x + 2$

$y = 4x - 2$

---

6. slope = -1, y-intercept = 6

A) $y = x - 6$

B) $y = -x + 6$

C) $y = 6x - 1$

D) $y = -6x + 1$

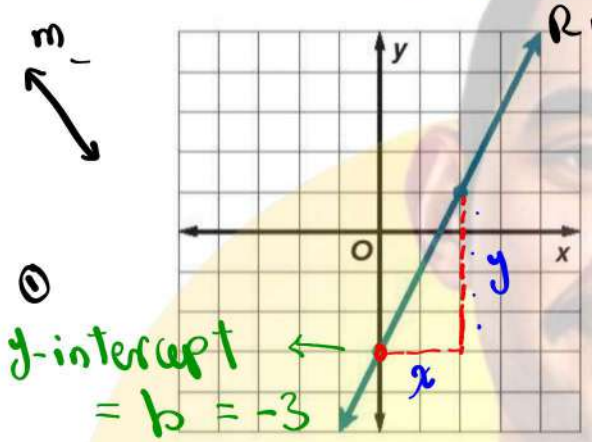
$y = -1x + 6$

$= -x + 6$

Q19-MCQ 4-5

7. Write an equation in slope-intercept form for the graph shown. (Example 3)

$y = mx + b$



① y-intercept ← $= b = -3$

② $m = \frac{y}{x} = \frac{4}{2}$

$m = 2$

A) y=2x+2

B) y=−2x+1

C) y=2x−3

D) y=−x+2

$y = 2x - 3$

---

8. The Augello family is driving from Columbus to St. Louis at a constant rate of 65 miles per hour. The distance between the two cities is 420 miles. Write an equation in slope-intercept form to represent the distance *y* in miles remaining after driving *x* hours. (Example 4)

A) y=420x+2

B) y=−65x+20

C) y=420x−65

D) y=−65x+420

m → slope (per - each - every)

↳ decreases $m = -65$

$y = mx + b$

$y = -65x + 420$

9. The table shows the costs for art show participants, including the $30 registration fee. Write an equation in slope-intercept form that represents the data in the table.

Number of Pieces of Art	Cost ($)
0	30
2	90
4	150
6	210
8	270

A) $y=30x+30$

B) $y=-x+30$

C) $y=30x-30$

D) $y=-30x+30$

x_1 y_1 x_2 y_2

$* m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{90-30}{2-0} = 30$

$* b = y$ at $x = 0$

$b = 30$

$y = mx + b$

$\boxed{y = 30x + 30}$

Q20-MCQ 4-6

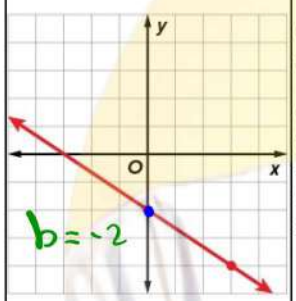
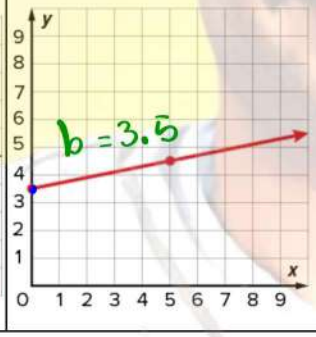
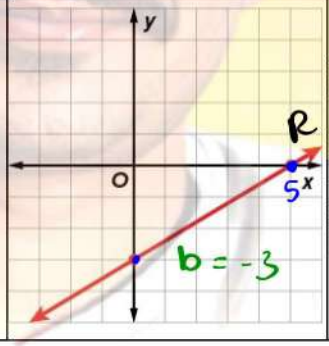
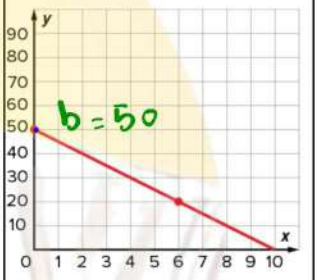
Graph each equation using the slope and *y*-intercept.

1. $y = \frac{3}{5}x - 3$

* y-intercept = b = −3
* m +
* Right

x	y
5	0

$\frac{3}{5}(5) - 3 = 3 - 3 = 0$

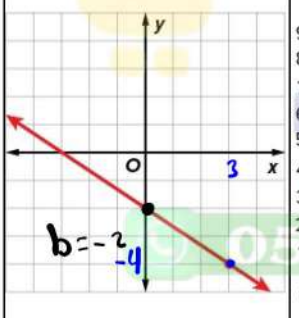
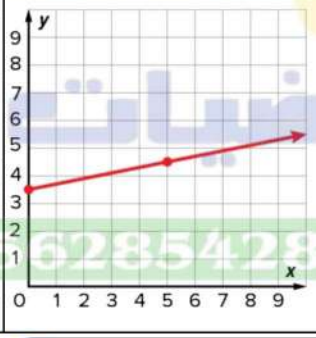
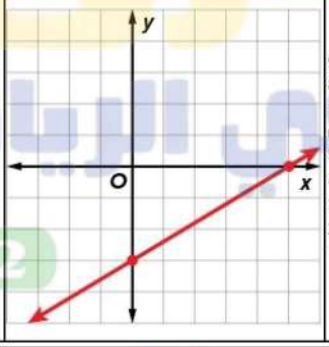
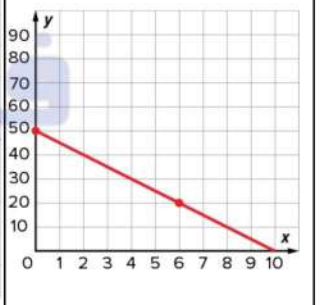
A	B	✓ C	D
			

2. $y = -\frac{2}{3}x - 2$

* y-intercept = b = −2
* m (−)
* Right

x	y
3	−4

$-\frac{2}{3}(3) - 2 = -2 - 2 = -4$

✓ A	B	C	D
			

3. The equation $y = \frac{1}{5}x + 3.5$ can be used to find the amount of accumulated snow y in inches x hours after 5 P.M. on a certain day Graph this equation. (Example 2)

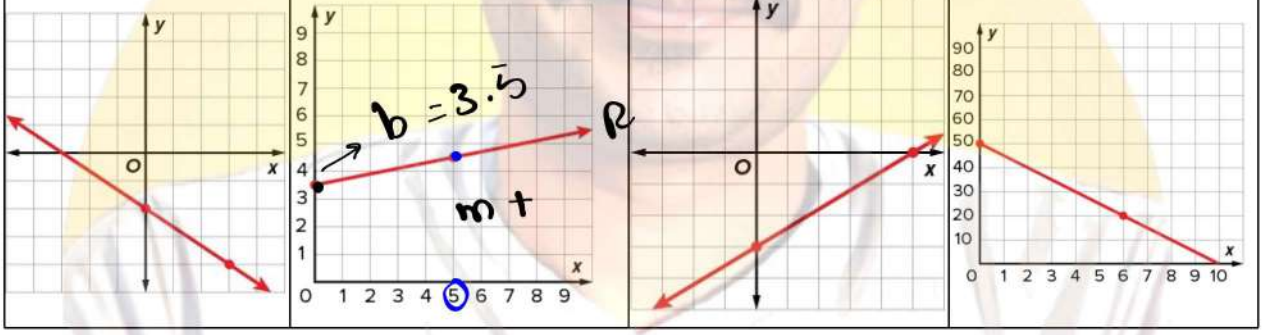
* $b = 3.5$

* m +

x	y
5	4.5

$\frac{1}{5}(5) + 3.5 = 1 + 3.5$
$= 4.5$

A | ✓ B | C | D



4. Alliyah's gift card balance can be represented by the equation $y = -5x + 50$, where y represents the gift card balance after x number of days. Graph this equation. (Example 2)

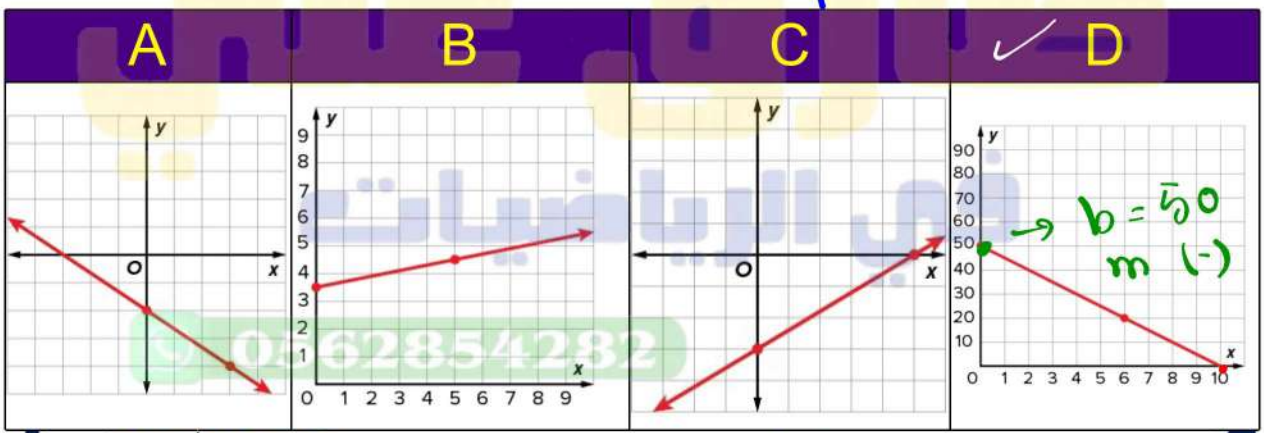
* $b = 50$

* m (-)

x	y
10	0

$-5(10) + 50$
$-50 + 50 = 0$

A | B | C | ✓ D



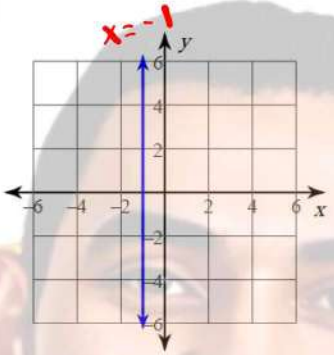
Graph each equation.

5. $y = -3$

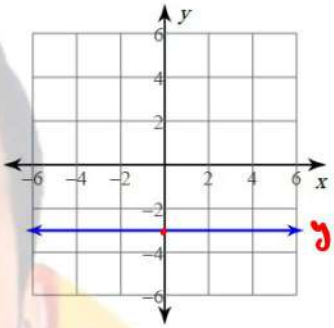
$y =$ عدد

Horizontal line

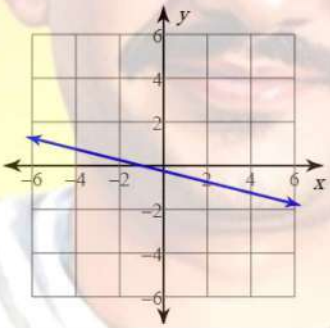
A)



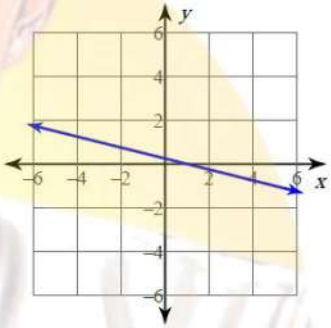
B)



C)



D)

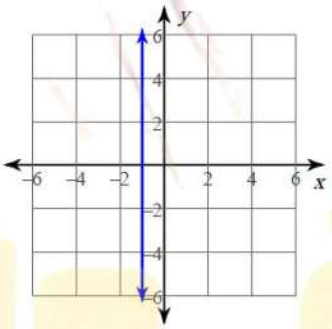


6. $x = 2$

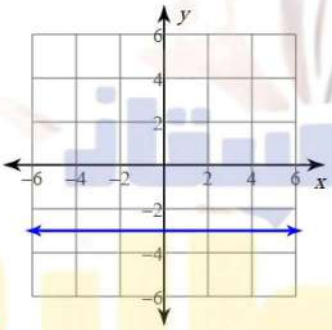
$x =$ عدد

vertical

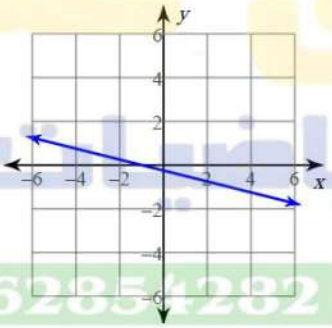
A)



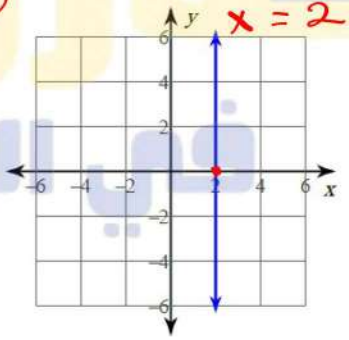
B)



C)



D)



Q21-FRQ 1-1

Write each expression using exponents. (Examples 1 and 2)

1. $(-7) \cdot (-7) \cdot 5 \cdot 5 \cdot 5 \cdot 5 =$ _____

$(-7)^2 \cdot 5^4$

2. $n \cdot n \cdot p \cdot p \cdot r \cdot r \cdot r =$ _____

$n^2 \cdot p^2 \cdot r^3$

Evaluate each numerical expression. (Example 3)

3. $3^4 - (-4)^2 =$ _____

$3.3.3.3 - (-4).(-4)$

$81 - 16 = 65$

4. $6 + 2^6 =$ _____

$6 + 2.2.2.2.2.2$

$6 + 64 = 70$

5. Evaluate $x^3 - y^2$ if $x = 2$ and $y = \frac{3}{4}$. (Example 4)

$2^3 - \left(\frac{3}{4}\right)^2$

$2.2.2 - \frac{3}{4} \cdot \frac{3}{4}$

$8 - \frac{9}{16}$

$7\frac{16}{16} - \frac{9}{16}$

$= 7\frac{7}{16}$

6. Evaluate $(g + h)^3$ if $g = 2$ and $h = -3$. (Example 5)

$(2 + -3)^3 =$

$(2 - 3)^3 =$

$(-1)^3 \longrightarrow$ odd $=$

$(-1) \cdot (-1) \cdot (-1) =$

$= \boxed{-1}$

7. Replace ☐ with <, >, or = to make a true statement: $(-3)^4$ ☐ $(-4)^3$.

$(-3)\cdot(-3)(-3)\cdot(-3)$ ☐ $(-4)\cdot(-4)\cdot(-4)$

9×9 ☐ $16\cdot(-4)$

81 > -64

---

8. A scientist estimates that, after a certain amount of time, there would be $2^5 \cdot 3^3 \cdot 10^5$ bacteria in a Petri dish. How many bacteria is this?

$2\cdot2\cdot2\cdot2\cdot2\cdot3\cdot3\cdot3\cdot100000$

$32 \cdot 27 \cdot 100000$

$864\,000\,00$

---

9. Multiselect Select all of the expressions that evaluate to negative rational numbers.

☐ $(-9)^4$ → even (+)

☑ $\left(-\frac{4}{5}\right)^3$ → odd (−)

☑ $3^5 - 10^4$ $= 243 - 10\,000 = -9757$

☑ $(9.8)^2 - 10^2$ $= 96.04 - 100 = -3.96$

☐ $\left(-\frac{3}{8}\right)^2$ → even (+)

Q22-FRQ 2-3

Identify whether each number is *rational* or *irrational*. (Example 1)

1. $-\sqrt{10}$ — Irrational

2. $-\frac{3}{11}$ → Fraction — Rational

3. $0.\overline{3}$ → repeated (bar) — Rational

4. $\sqrt{81} = 9$ integer — Rational

5. $0 = \frac{0}{1}$ — Rational

6. $-\frac{\sqrt{2}}{2}$ → ليست كسر — Irrational

7. $\sqrt{7}$ — Irrational

8. $\frac{\sqrt{2}}{\sqrt{2}} = 1$ integer — Rational

Select all the sets of numbers to which each real number belongs. (Examples 2–4)

9. $\sqrt[3]{343} = 7$
   - (A) Rational
   - (B) Irrational
   - (C) Integer ±
   - (D) Whole
   - (E) Natural

10. $\frac{7}{\sqrt{2}}$
    - (A) Rational
    - (B) Irrational
    - (C) Integer
    - (D) Whole
    - (E) Natural

11. $-\frac{7}{1} = -7$
    - (A) Rational
    - (B) Irrational
    - (C) Integer ±
    - (D) Whole +
    - (E) Natural +

$\sqrt{1} = 1$	$\sqrt{11} = 3.3166$	$\sqrt{21} = 4.5825$
$\sqrt{2} = 1.4142$	$\sqrt{12} = 3.4641$	$\sqrt{22} = 4.6904$
$\sqrt{3} = 1.732$	$\sqrt{13} = 3.6055$	$\sqrt{23} = 4.7958$
$\sqrt{4} = 2$	$\sqrt{14} = 3.7416$	$\sqrt{24} = 4.8989$
$\sqrt{5} = 2.236$	$\sqrt{15} = 3.8729$	$\sqrt{25} = 5$
$\sqrt{6} = 2.4494$	$\sqrt{16} = 4$	$\sqrt{26} = 5.099$
$\sqrt{7} = 2.6457$	$\sqrt{17} = 4.1231$	$\sqrt{27} = 5.1961$
$\sqrt{8} = 2.8284$	$\sqrt{18} = 4.2426$	$\sqrt{28} = 5.2915$
$\sqrt{9} = 3$	$\sqrt{19} = 4.3588$	$\sqrt{29} = 5.3851$
$\sqrt{10} = 3.1622$	$\sqrt{20} = 4.4721$	$\sqrt{30} = 5.4772$

$\sqrt{1} = 1$	$\sqrt{36} = 6$	$\sqrt{121} = 11$	$\sqrt{256} = 16$	$\sqrt{441} = 21$
$\sqrt{4} = 2$	$\sqrt{49} = 7$	$\sqrt{144} = 12$	$\sqrt{289} = 17$	$\sqrt{484} = 22$
$\sqrt{9} = 3$	$\sqrt{64} = 8$	$\sqrt{169} = 13$	$\sqrt{324} = 18$	$\sqrt{529} = 23$
$\sqrt{16} = 4$	$\sqrt{81} = 9$	$\sqrt{196} = 14$	$\sqrt{361} = 19$	$\sqrt{576} = 24$
$\sqrt{25} = 5$	$\sqrt{100} = 10$	$\sqrt{225} = 15$	$\sqrt{400} = 20$	$\sqrt{625} = 25$

Q23-FRQ 2-5

5. Order the set $\left\{3\frac{1}{2}, \frac{10}{3}, \pi, \sqrt{13}\right\}$ from least to greatest. Then graph the set on the number line. (Example 3)

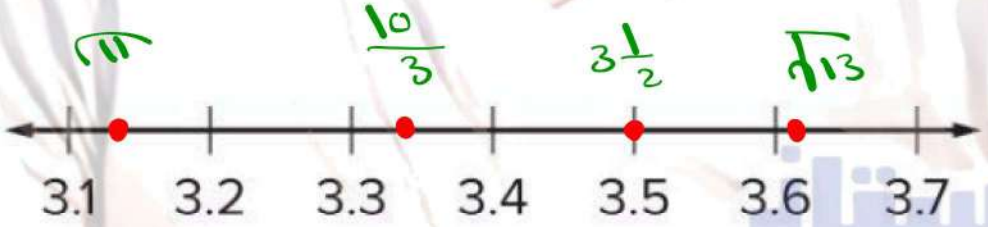
$* 3\frac{1}{2} = 3.50$

$* \frac{10}{3} = 3\frac{1}{3} = 3.\overline{3} \approx 3.33$

$* \pi = 3.14$

$* \sqrt{13} = 3.61$

$\Rightarrow \pi , \frac{10}{3} , 3\frac{1}{2} , \sqrt{13}$



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6. The table shows the foul-shot statistics for three players in a recent basketball game. Which player had the greatest foul-shot statistic? (Example 4)

Player	Foul-Shot Statistic
1	$\frac{7}{9}$
2	72%
3	8 out of 10

$* \frac{7}{9} = 0.\overline{7} \approx 0.77$

$* 72\% = \frac{72}{100} = 0.72$

$* \frac{8}{10} = 0.80$

$\frac{8}{10} > \frac{1}{9} > 12\%$

Greatest is Player 3.

---

7. Multiple Choice Select the symbol that makes the sentence true.

$\sqrt{27} \_\_ \frac{\sqrt{95}}{2}$

Ⓐ <

Ⓑ >

Ⓒ =

Ⓓ ≤

$* \sqrt{27} \approx 5.20$

$* \frac{\sqrt{95}}{2} = \frac{9.75}{2}$

≈ 4.88

$5.20 > 4.88$

$\sqrt{27} > \frac{\sqrt{95}}{2}$

Q24-FRQ 3-1

Solve each equation. Check your solution.

1. $-2a - 9 = 6a + 15$

$-9 - 15 = 6a + 2a$

$-24 = 8a$

$\frac{-24}{8} = a$

$\boxed{a = -3}$

---

2. $14 + 3n = 5n - 6$

$14 + 6 = 5n - 3n$

$20 = 2n$

$\frac{20}{2} = n$

$\boxed{n = 10}$

3. $\frac{1}{2}x - 5 = 10 - \frac{3}{4}x$

$2\times\frac{1}{2}x + \frac{3}{4}x = 10 + 5$

$\frac{2}{4}x + \frac{3}{4}x = 15$

$\frac{5}{4}x = 15$ Flip

$x = 15 \cdot \frac{4}{5} = 3(4) = \boxed{12}$

---

4. $\frac{2}{3}y + 1 = \frac{1}{6}y + 8$

$2\times\frac{2}{2\times3}y - \frac{1}{6}y = 8 - 1$

$\frac{4}{6}y - \frac{1}{6}y = 7$

$\frac{1}{2}y = 7$

$y = 7 \cdot \frac{2}{1} = \boxed{14}$

5. $5.4p + 13.1 = -2.6p + 3.5$

$5.4p + 2.6p = -13.1 + 3.5$

$8p = -9.6$

$p = \frac{-9.6}{8} = \boxed{-1.2}$

---

6. $0.15w + 0.35 = 0.22w - 0.14$

$0.35 + 0.14 = 0.22w - 0.15w$

$0.49 = 0.07w$

$w = \frac{0.49}{0.07}$

$w = \frac{49}{7}$

$\boxed{w = 7}$

7. Twelve more than seven times a number equals the number less six. Solve the equation $7x + 12 = x - 6$ to find the number, x.

$$7x - x = -12 - 6$$
$$6x = -18$$
$$x = \frac{-18}{6}$$
$$\boxed{x = -3}$$

---

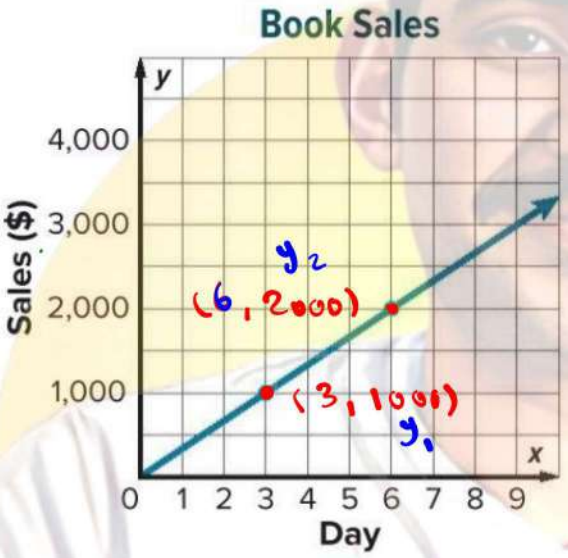
8. Equation Editor Solve the equation shown for x.

$$3x - 15 = 17 - x$$

$$3x + x = 17 + 15$$
$$4x = 32$$
$$x = \frac{32}{4}$$
$$\boxed{x = 8}$$

Q25-FRQ 4-1

1. The graph shows the amount of book sales over several days. Find and interpret the slope. Then find the unit rate and compare it to the slope. (Example 1)



* slope $m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{2000 - 1000}{6 - 3} = \frac{1000}{3}$

$\approx 333.\overline{3}$

* book sales is $333.\overline{3}$ $ each day

* unit rate $= 333.\overline{3}$ $/day

---

2. The cost y of renting a snowmobile for x hours is a proportional relationship. This can be represented by the equation $y = 33.75x$.

① Graph the equation. Then find and interpret

② the slope. (Example 2)

*② slope $= m = 33.75$

cost is 33.75 $ per hour

* $y = 33.75x$

x	y
0	0
4	135

$33.75(0) = 0$

$33.75(4) = 135$

---

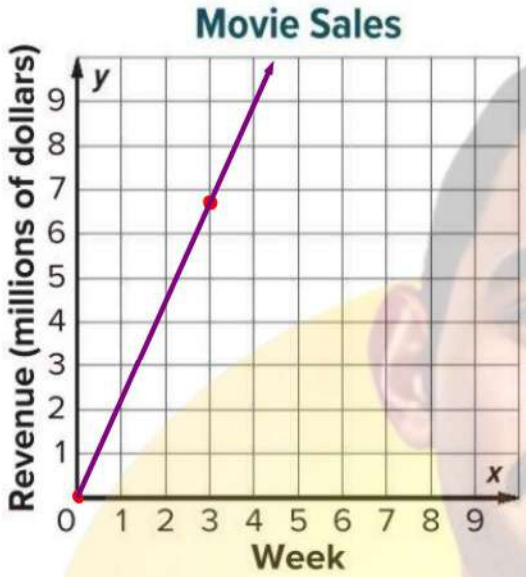
3. By the end of its fourth week, a movie had grossed $9.2 million. Assume the revenue y in millions of dollars is proportional to the week x. Graph this relationship on the coordinate plane. Then find and interpret the slope. (Example 3)

* slope $m = \frac{y}{x} = \frac{\text{cost}}{\text{weeks}} = \frac{9.2}{4}$

$m = 2.3$

means: cost is 2.30 $million per week

* $y = mx \rightarrow \boxed{y = 2.3x}$



$y = 2.3x$

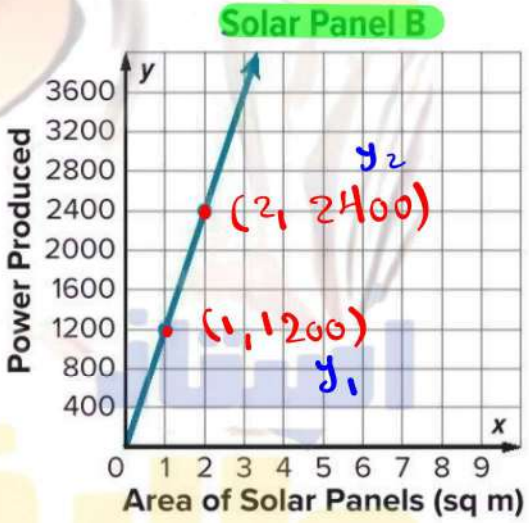
x	y
0	0
3	6.9

$2.3(0) = 0$

$2.3(3) = 6.9$

---

4. The amount of power y solar panel A can produce with an area of x square meters can be represented by the equation $y = 1{,}020x$. The amount of power a solar panel B can produce is shown on the graph. Which solar panel can produce more power? Explain. (Example 4)

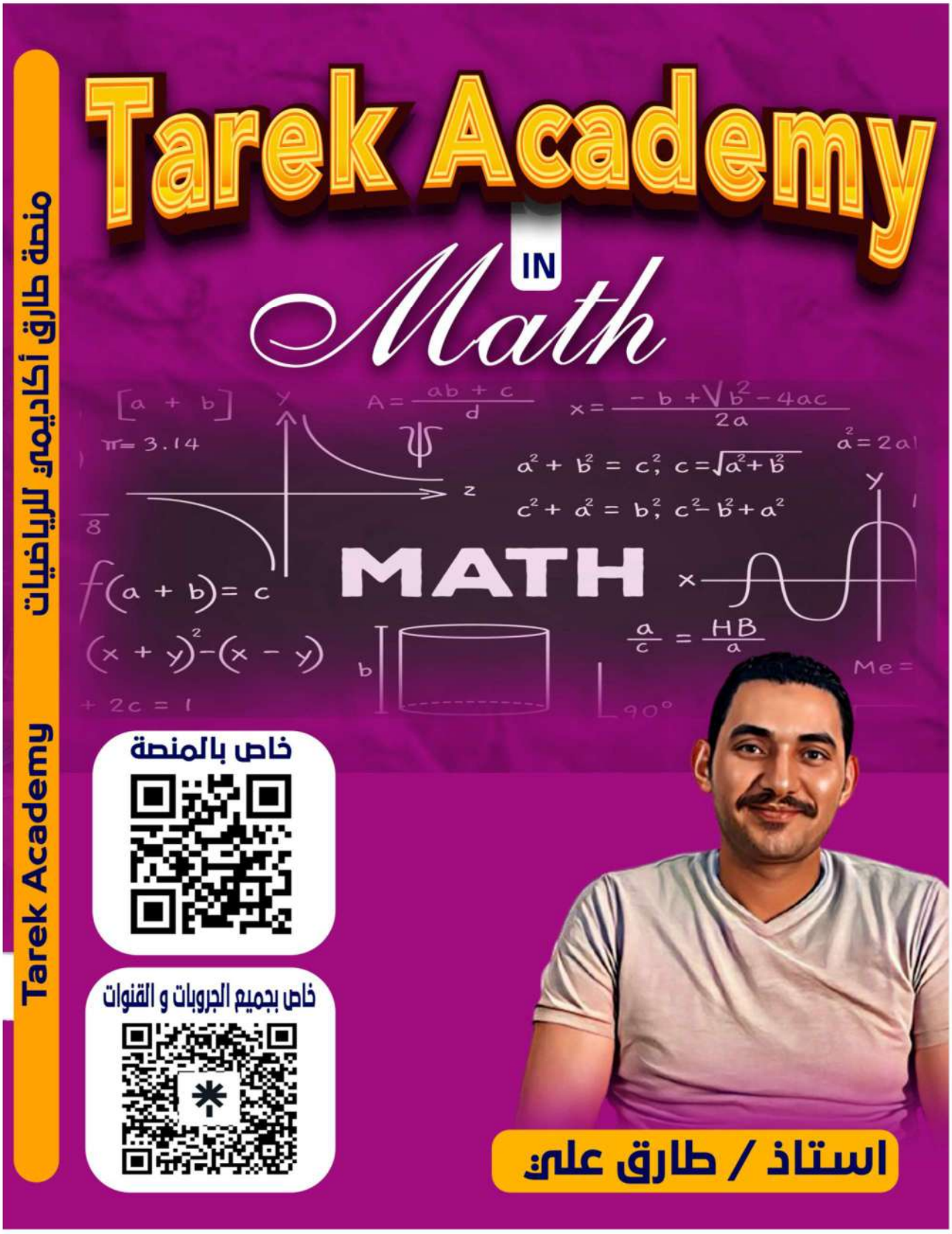


*Panel A → $y = 1020x$

Slope $m = 1020$

*Panel B slope $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2400 - 1200}{2 - 1}$

$m = 1200$ Panel B is more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