

11

Choose the Correct answer:

1) One of the following number is irrational:

a)  $\sqrt{9}$

b)  $-\frac{2}{3}$

c) 3.14

d) 0.010010001...

2) The Set  $\left\{\frac{a}{b} : a, b \in \mathbb{Z}, b \neq 0\right\}$  is called:

a) real numbers

b) integers

c) natural numbers

d) rational

3) The integers set is:

a)  $\{1, 2, 3, \dots\}$

b)  $\{0, 1, 2, 3, \dots\}$

c)  $\{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$

d)  $\{\dots, -3, -2, -1, 0\}$

4) The expression "Three less than twice a number" translated to:

a)  $3 - x^2$

b)  $2x - 3$

c)  $x^2 - 3$

d)  $3 - 2x$

5) 35% of 40 is: 2

a) 35

b) 0.875

c) 14

d) 10

---

6) What percent of 200 is 1:

a) 5%

b) 25%

c) 10%

d) 0.5%

---

7) "Two out of some number" translated to:

a)  $2x$

b)  $\frac{2}{x}$

c)  $\frac{x}{2}$

d)  $x^2$

---

8) The slope of the line passing through  $(-2, -3)$  and  $(-4, -6)$  is:

a)  $\frac{2}{3}$

b)  $-\frac{3}{2}$

c)  $\frac{3}{2}$

d)  $-\frac{2}{3}$

---

9) The slope of the line  $2y = 5$  is:

a) 2

b) 5

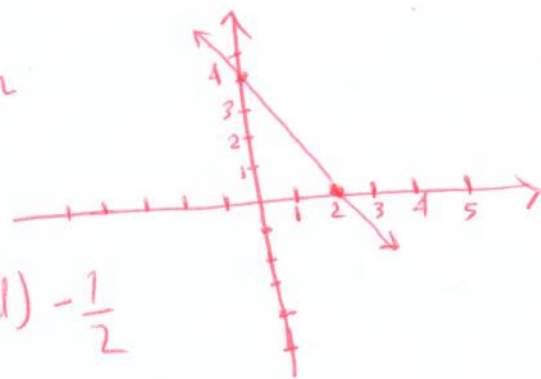
c) 0

d) undefined

10) 3 The slope of the line  $x=0$  is :

- a) 0      b) 1      c) -1      d) undefined
- 

11) The slope of the line showed in the graph is :



- a)  $\frac{1}{2}$       b) -2      c) 2      d)  $-\frac{1}{2}$
- 

12) The line which has slope of -3 is :

- a) decreasing      b) increasing      c) vertical      d) horizontal
- 

13) The point  $(-3, -2)$  is located at the quadrant :

- a) III      b) I      c) IV      d) II
- 

14) The second coordinate is negative at the quadrants :

- a) III and IV      b) III and I      c) I and II      d) I and IV

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15) The first coordinate is positive at the coordinates:

a) I and II

b) II and III

c) I and IV

d) III and IV

---

16) The x-intercept of  $2x + 3y = 6$  is:

a) (0, 3)

b) (3, 0)

c) (-3, 0)

d) (2, 0)

---

17) The y-intercept of  $x - \frac{y}{2} = -5$  is:

a) (10, 0)

b)  $(\frac{5}{2}, 0)$

c)  $(\frac{2}{5}, 0)$

d) (-10, 0)

---

18) The degree of  $7 - 10x$  is:

a) 10

b) -10

c) 7

d) 1

---

19) The degree of 5 is:

a) 5

b) 1

c) -1

d) 0

5

20) The degree of  $2x^2y^3 - x^3y^4 + 5w^6$  is :

- a) 6                      b) 3                      c) 4                      d) 7
- 

21) The polynomial  $2xyz$  is :

- a) Binomial                      b) Trinomial                      c) Monomial                      d) None
- 

22) The polynomial  $3x^4 - x^3 + x^2 - 1$  is :

- a) Monomial                      b) Binomial                      c) Trinomial                      d) None
- 

23) One of the following is Trinomial :

- a)  $x^3$                       b)  $3x$                       c)  $xyz$                       d)  $x+y+1$
- 

24) One of the following is polynomial :

- a)  $\frac{3}{x+1}$                       b)  $1 - \sqrt{2}x$                       c)  $\sqrt{x} + 3$                       d)  $x^{-2} + x^{\frac{5}{3}}$

6

25) One of the following points satisfies the inequality  $2x + 3y \leq 5$  :

a) (1, 3)

b) (-1, 3)

c) (1, 1)

d) (2, 2)

---

26) One of the following points is located on the line  $y = 2x - 3$  :

a) (2, 3)

b) (0, -3)

c) (3, 2)

d) (-3, 0)

---

27) The value of  $-x^2$  when  $x = -3$  is :

a) 9

b) -6

c) 6

d) -9

---

28) The value of  $\frac{2x^2y - 3}{y^2 + 3x}$  when  $x = -2$  and  $y = 3$  is :

a) 7

b)  $\frac{1}{7}$

c) -1

d) 3

29) The sum of two numbers with different signs (positive + negative) is:

a) positive

b) zero

c) negative

d) Can not be determined

30) The multiplication of two negative numbers is:

a) Can not be determined

b) positive

c) negative

d) zero

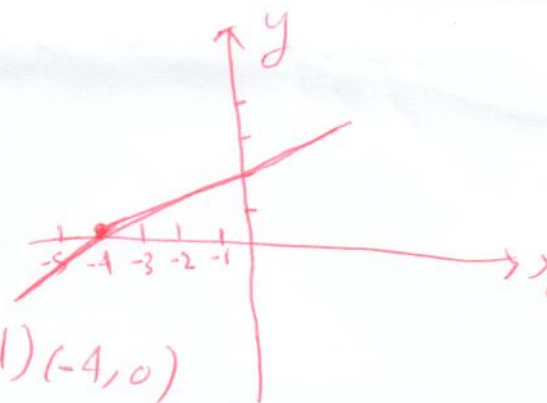
31) The x-intercept of the line as showed in the graph is:

a) (2, 0)

b) (0, 2)

c) (0, -4)

d) (-4, 0)



32) The simplification of  $(-2x^2y^3)^2$  is:

a)  $-4x^4y^{-6}$

b)  $-4x^4y^5$

c)  $4x^4y^{-6}$

d)  $4x^4y^{-1}$

33) The simplification of  $\boxed{8}$   $(-3x^{-2}y^3)^3$

a)  $\frac{27y^9}{x^6}$

b)  $-\frac{27y^6}{x}$

c)  $-\frac{27y^9}{x^6}$

d)  $\frac{27y^6}{x}$

34) The value of  $\left(\frac{2}{3}\right)^{-3}$  is:

a)  $\frac{8}{27}$

b)  $-\frac{6}{9}$

c)  $\frac{27}{8}$

d)  $-\frac{1}{3}$

35) The value of  $\left(-\frac{3}{5}\right)^0$  is:

a) 0

b)  $-\frac{3}{5}$

c)  $\frac{3}{5}$

d) 1

36) The simplification of  $\left(\frac{4x^2}{y^3}\right)\left(\frac{-3}{2y}\right)^2$  is:

a)  $\frac{1}{x^4y^5}$

b)  $\frac{x^4}{y^5}$

c)  $\frac{y^5}{x^4}$

d)  $x^4y^5$

37) If  $a < 0$ ,  $b < 0$ , then:

a)  $a+b=0$

b)  $a+b < 0$

c)  $a+b > 0$

d) ~~value~~ <sup>the sign</sup> of  $a+b$  can not be determined.



9

38) The multiplicative inverse of  $-2$  is:

a)  $2$

b)  $-\frac{1}{2}$

c)  $\frac{1}{2}$

d)  $-2$

---

39) The additive inverse of  $\frac{3}{5}$  is:

a)  $\frac{3}{-5}$

b)  $\frac{5}{3}$

c)  $-\frac{5}{3}$

d)  $\frac{3}{5}$

---

40) If the point  $(3, 3a-2)$  is located on the line  $y = 2x - 1$ , then the value of  $a$  is:

a)  $\frac{7}{3}$

b)  $3$

c)  $-2$

d)  $\frac{3}{7}$

---

41) If the slope of the line containing  $(-1, -2)$  and  $(0, a)$  is  $3$ , then the value of  $a$  is:

a)  $-3$

b)  $3$

c)  $1$

d)  $-1$

---

(2)

6. The degree of  $f(x) = 2 - x$  is :

a) 1

b) 2

c) -1

d) 0

7. one of the following ordered pairs is a solution of the equation  $y = 3x - 1$  :

a) (2, 4)

b) (3, 1)

c) (0, 0)

d) (-1, -4)

عوضت قيم  $x$  و  $y$  في كل خيار في المعادلة الأصلية

a)  $\begin{matrix} x & y \\ (2, 4) \end{matrix}$  :  $4 = 3(2) - 1$   
 $4 = 6 - 1$   
 $4 = 5$  X

b) (3, 1) :  $1 = 3(3) - 1$   
 $1 = 9 - 1$   
 $1 = 8$  X

c) (0, 0) :  $0 = 3(0) - 1$   
 $0 = 0 - 1$   
 $0 = -1$  X

d) (-1, -4)  
 $-4 = 3(-1) - 1$   
 $-4 = -3 - 1$   
 $-4 = -4$  ✓

8. The result of  $(2x+3)(2x-3)$  is :

a)  $2x - 6$

b)  $4x^2 - 6$

c)  $4x^2 - 9$

d)  $4x$

$(2x+3)(2x-3) = 4x^2 - 6x + 6x - 9$   
 $= 4x^2 - 9$   
 ①

مربع الأول - مربع الثاني  
 ②

3

9. The Scientific notation of 0.000000375 is :

- a)  $3.75 \times 10^7$       b)  $37.5 \times 10^{-8}$       **c)  $3.75 \times 10^{-7}$**       d)  $37.5 \times 10^8$

الحل:

0.000000375  
 نحركنا ص منازل الى اليمين

10. The Simplification of  $(-2x^3y^2)^2$  is :

- a)  $-4x^6y^4$       b)  $4x^5y^4$       **c)  $4x^6y^4$**       d)  $2x^6y^4$

$$(-2x^3y^2)^2 = (-2)^2 \cdot x^6 \cdot y^4 = 4x^6y^4$$

11. The Set for which the rational expression  $\frac{(x+2)(x-1)}{(x+3)(x-4)}$  is not defined :

- a)  $\{2, -1\}$       b)  $\{-2, 1\}$       **c)  $\{-3, -4\}$**       d)  $\{3, -4\}$

الحل:

not defined: المقام = صفر

$$(x+3)(x-4) = 0$$

$$\begin{array}{l|l} x+3=0 & x-4=0 \\ \hline x=-3 & x=4 \end{array}$$

(4)

12. Lcm ( $x^2 - x$ ,  $x^2 - 1$ ) = :

a)  $x^3 - x$

b)  $x - 1$

c)  $x^4 - x$

d)  $x(x+1)$

الحل:

$x^2 - x = x(x-1)$

$x^2 - 1 = (x-1)(x+1)$

الانواع

$x$   
 $x-1$   
 $x+1$

اختر الاس الاعلى  
من كل نوع

Lcm =  $x(x-1)(x+1)$

=  $x(x^2 - 1)$

=  $x^3 - x$

13. 30 is what percent of 150 :

a) 30%

b) 25%

c) 15%

d) 20%

الحل:

$30 = x \cdot 150$

$x = \frac{30}{150} = 0.2$

$0.2 (100) = 20\%$

14. The opposite (additive inverse) of  $-\frac{3}{2}$  is:

- a)  $\frac{2}{3}$
- b)  $\frac{3}{2}$
- c)  $\frac{3}{-2}$
- d)  $-\frac{2}{3}$

نقطه العكس الاضداد

15. The reciprocal (multiplicative inverse) of  $-\frac{2}{3}$  is

- a)  $\frac{3}{-2}$
- b)  $\frac{3}{2}$
- c)  $\frac{2}{-3}$
- d)  $\frac{2}{3}$

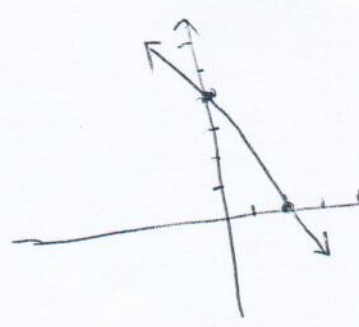
نقطه العكس الضرب

16. The slope of the line in the figure is:

- a)  $-\frac{1}{2}$
- b)  $\frac{1}{2}$
- c) 2
- d) -2

$x_1$   $y_1$   
 $(0, 4)$   
 $(2, 0)$   
 $x_2$   $y_2$

الميل



$$\text{Slope} = m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 4}{2 - 0} = \frac{-4}{2} = -2$$

6

17. The slope of the line  $y = 2 - 3x$  is:

- a) 2      b) 3      c) -2      d) -3

Slope:  $x$  ~~is~~

---

18. The result of the division  $\frac{9x^5 - 6x^3}{3x^2}$  is equal to:

- a)  $9x^3 - 2x$       **b)  $3x^3 - 2x$**       c)  $3x^3 - 6x$       d)  $3x^7 - 2x^5$

$$\frac{9x^5}{3x^2} - \frac{6x^3}{3x^2} = 3x^3 - 2x$$

---

19. The y-intercept of  $x - 3y = 6$  is:

- a) (3, -1)      b) (6, 0)      c) (-3, -3)      **d) (0, -2)**

put  $x = 0$  →

$$0 - 3y = 6$$

$$-3y = 6$$

$$y = \frac{6}{-3} = -2$$

$$(0, -2)$$

20. The factorization of  $6x^3 - 2x^2 + 3x + 1$  is :

a)  $(2x^2 - 1)(3x - 1)$

b)  $(2x - 1)(3x^2 - 1)$

c)  $(3x^2 + 1)(2x + 1)$

**d)  $(2x^2 + 1)(3x + 1)$**

Ans

Grouping

$$\underline{6x^3 + 2x^2} + \underline{3x + 1}$$

$$2x^2(3x + 1) + (3x + 1)$$

$$= (3x + 1)(2x^2 + 1)$$

21. The expression  $\frac{x^2 y}{9x^{-3} y^2}$  with positive exponents is :

a)  $\frac{x^5}{9y}$

b)  $\frac{9}{x^5 y^3}$

c)  $9x^5 y^3$

d)  $\frac{x^5 y^3}{9}$

Ans

$$\frac{x^2 y}{9x^{-3} y^2} = \frac{x^{2-(-3)} y^{1-2}}{9} = \frac{x^5 y^{-1}}{9} = \frac{x^5}{9y}$$

9

Q perform and simplify

$$\frac{x^2 + 7x + 10}{x^2 - 25} \div \frac{x^2 + x - 2}{10 - 2x}$$

$$\Rightarrow \frac{x^2 + 7x + 10}{x^2 - 25} \cdot \frac{10 - 2x}{x^2 + x - 2}$$

$$= \frac{(x+5)(x+2)}{(x-5)(x+5)} \cdot \frac{2(5-x)}{(x+2)(x-1)}$$

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

---



Graph the equation  $2x + 3y = 6$  using intercepts:

a) x-intercept [put  $y=0$ ]

$$2x - 3(0) = 6$$

$$2x - 0 = 6 \Rightarrow (3, 0)$$

$$2x = 6$$

$$x = 3$$

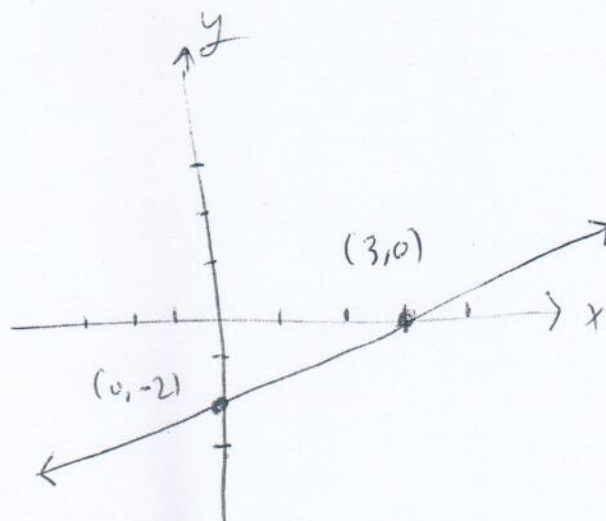
b) y-intercept [put  $x=0$ ]

$$2(0) - 3y = 6$$

$$0 - 3y = 6$$

$$-3y = 6 \Rightarrow (0, -2)$$

$$y = \frac{6}{-3} = -2$$



simplify

$$\frac{x^2 - 1}{(x+1)^2} \cdot \frac{2x^2 + 4x + 2}{x^2 - 3x + 2}$$

$$\frac{(x-1)(x+1)}{(x+1)(x+1)} \cdot \frac{2(x^2 + 2x + 1)}{(x-2)(x-1)}$$

$$= \frac{\cancel{(x-1)}(\cancel{x+1})}{(\cancel{x+1})(\cancel{x+1})} \cdot \frac{2(\cancel{x+1})(x+1)}{(x-2)(\cancel{x-1})}$$

$$= \boxed{\frac{2(x+1)}{x-2}}$$

Q

factor

$$x^2 - 3xy + 28y^2$$

اولاً : اعتبري غير متغيرة

$$\Rightarrow x^2 - 3x + 28$$

$$(x-7)(x+4)$$

by calculator

$$(7, -4)$$

العوامل

ثم اضربي

$$(x-7y)(x+4y)$$

(12)

Solve  $\frac{x}{2} - \frac{x+1}{3} = 4 - \frac{2}{5}x$

multiply by 30

$$\frac{x}{2} \cdot 30 = \frac{30x}{2} = 15x$$

$$\bullet \frac{x+1}{3} \cdot 30 = \frac{30(x+1)}{3} = 10(x+1) = 10x + 10$$

$$4 \cdot 30 = 120$$

$$\frac{2}{5}x \cdot 30 = \frac{60x}{5} = 12x$$

$$\Rightarrow 15x - (10x + 10) = 120 - 12x$$

$$15x - 10x - 10 = 120 - 12x$$

$$15x - 10x + 12x = 120 + 10$$

$$17x = 130$$

$$x = \frac{130}{17}$$

Choose the correct answer:

11

1. One of the following is a difference of squares:

a)  $x^2 + 1$

b)  $x^2 - x$

c)  $9x^4 - 1$

d)  $x^2 - 4x + 5$

Difference of squares: *مكون من عددين نقط بينهما إشارة*

*طرح • الممتد الأول لا غير الثاني له غير*

$$\frac{9x^4 - 1}{3x^2 \quad 1} = (3x^2 - 1)(3x^2 + 1)$$

2. The slope of the line  $y = -5$  is equal to:

a) 1

b) 0

c) -5

d) -1

*Slope = 0: أي صاف لا يوجد لها*

3. The result of  $(x^3 + y^2)^2$  is:

a)  $2x^3 + 2y^2$

b)  $x^6 - 2x^3y^2 + y^4$

c)  $x^6 + y^4$

d)  $x^6 + 2x^3y^2 + y^4$

*تكرار القوس مرتين*  
 $(x^3 + y^2)^2 = (x^3 + y^2)(x^3 + y^2)$

$$= x^6 + x^3y^2 + y^2x^3 + y^4$$

$$= x^6 + 2x^3y^2 + y^4$$

4. The x-intercept for the equation  $2x - 3y = -12$  is: 12

a)  $(0, -9)$

b)  $(0, 4)$

**c)  $(-6, 0)$**

d)  $(-14, 0)$

x-intercept:

$y = 0$  cross

$$2x - 3y = -12$$

$$2x - 3(0) = -12$$

$$2x - 0 = -12$$

$$2x = -12$$

$$x = \frac{-12}{2} = \underline{\underline{-6}}$$

$$x = -6$$

$$y = 0 \Rightarrow (-6, 0)$$

---

5.  $\text{LCM}(x^2 + 3x + 2, 2x + 4) =$  :

**a)  $2(x+1)(x+2)$**

b)  $4(2x+1)(x+5)$

c)  $2(x-1)(x-3)$

d)  $x+2$

$$x^2 + 3x + 2 = (x+2)(x+1)$$

$$2x + 4 = 2(x+2)$$

على الأعداد:  $(x+1)$ ,  $(x+2)$  و 2

الأسس الأصغر:  $(x+1)^1$ ,  $(x+2)^1$  و 2

$$\text{LCM} = 2(x+1)(x+2)$$

$$6. \text{GCF}(x^2+3x+2, 2x+4) = :$$

3

- a)  $2(x+1)(x+2)$       b)  $2(x+2)$       c)  $(x+2)^2$       d)  $x+2$

$$x^2+3x+2 = (x+2)(x+1)$$

$$2x+4 = 2(x+2)$$

$(x+2)$  : السيادة المشتركة

$(x+2)^1$  : الاصغر

$$\therefore \text{GCF} = (x+2)$$

7. The solution set for the equation  $(5x-4)(3x+2)=0$  is:

- a)  $\{\frac{3}{4}, -\frac{7}{5}\}$       b)  $\{-\frac{4}{5}, \frac{2}{3}\}$       c)  $\{\frac{5}{4}, -\frac{3}{2}\}$       d)  $\{\frac{4}{5}, -\frac{2}{3}\}$

$$(5x-4)(3x+2) = 0$$

$$5x-4 = 0 \quad | \quad 3x+2 = 0$$

$$5x = 4 \quad | \quad 3x = -2$$

$$x = \frac{4}{5} \quad | \quad x = -\frac{2}{3}$$

$$\left\{ \frac{4}{5}, -\frac{2}{3} \right\}$$

8. The scientific notation for the number 0.000000687 is :

- a)  $68.7 \times 10^{-8}$
- b)  $0.687 \times 10^{-6}$
- c)  $6.87 \times 10^7$
- d)  $6.87 \times 10^{-7}$**

حركه (.) بحيث يكون على يسارها عدد واحد فقط



$6.87 \times 10^{-7}$  عدد المنزلة التي تحركناها

إذا تحركنا لليمين : الأس سالب  
إذا تحركنا لليسار : الأس موجب

9. 27 is 45% of what number?

- a) 1215
- b) 58
- c) 60**
- d) 72

27 is 45% of what number  
 $(=) \frac{45}{100} = 0.45$  (.)

$27 = 0.45 \cdot x$

$x = \frac{27}{0.45} = 60$

10. which of the following is not a true statement:

- a)  $-7 < -7$**
- b)  $-7 \geq -7$
- c)  $-7 = -7$
- d)  $-7 \leq -7$

ملاحظة: الأعداد الموجبة دائماً أكبر من السالبة

الأعداد السالبة تقل كلما جبر العدد

إذا كان العددان متساويان يجوز كتابته :  $=$  أو  $\leq$  أو  $\geq$  بينها

مثال :  $5 > 5$  /  $5 \leq 5$  /  $5 \geq 5$  /  $5 < 5$

$x > 5$  /  $5 < x$  /

11. One of the following is true:

5

a)  $-\frac{2}{3} > \frac{5}{-6}$

b)  $\frac{3}{4} \leq \frac{1}{2}$

c)  $\frac{1}{-2} < \frac{-1}{2}$

d)  $\frac{3}{6} = \frac{2}{5}$

مقارنة الأعداد:

① يجب أن تكون إشارة السالب (-) في الأعداد

② اقلب طرفي المتبادلي

a)  ~~$\frac{-2}{3} > \frac{-5}{6}$~~   $-12 > -15$  ✓

b)  ~~$\frac{3}{4} \leq \frac{1}{2}$~~   $6 \times 4 \times$

c)  ~~$\frac{-1}{2} < \frac{-1}{2}$~~   $-2 < -2 \times$

d)  ~~$\frac{3}{6} = \frac{2}{5}$~~   $15 = 12 \times$



12) The slope of the vertical line is: 6

- a) 0      b) 1      c) -1      d) Not defined

vertical : Slope undefined

horizontal : Slope = 0

13)  $\text{LCM}(x^2-25, (x+5)^2) = :$

- a)  $(x^2-25)(x+5)^2$       b)  $x+5$       c)  $(x+5)^2(x-5)$       d)  $(x-5)(x+5)$

$$x^2 - 25 = (x-5)(x+5)$$

$$(x+5)^2 = (x+5)(x+5) = (x+5)^2$$

$$(x-5)(x+5) \quad : \text{كل الاضلاع}$$

$$(x-5)^1, (x+5)^2 \quad : \text{الاصغر}$$

$$\text{LCM} = (x-5)(x+5)^2$$

14)  $\text{GCF}(x^2-25, (x+5)^2) = :$

- a)  $(x^2-25)(x+5)^2$       b)  $x+5$       c)  $(x+5)^2(x-5)$       d)  $(x-5)(x+5)$

$$x^2 - 25 = (x-5)(x+5)$$

$$(x+5)^2 = (x+5)^2$$

$$(x+5) \quad : \text{الاصغر المشترك}$$

$$(x+5) \quad : \text{الاصغر المشترك}$$

$$\text{GCF} = (x+5)$$

15. The solution set for the equation  $x^2 = -9$  7

a)  $\{-3, 3\}$

b)  $\emptyset$

c)  $\{-9, 9\}$

d)  $\{-81, 81\}$

مثلا آخر  
 $-3x^2 = 27$   
 $x^2 = \frac{27}{-3}$   
 $x^2 = -9$   
 No Solution

$x^2 = -9$

$x = \pm \sqrt{-9} \rightarrow$

No Solution:  $\emptyset$

العدد البليس  
لا يوجد

$x^2 + 9 = 0$  أو  
 Prime

No Solution

16. The solution of  $-x^2 = -9$  is :

a)  $\{-3, 3\}$

b)  $\emptyset$

c)  $\{-9, 9\}$

d)  $\{-81, 81\}$

$-x^2 = -9$

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

$x^2 = 9$

$x = \pm \sqrt{9} = \pm 3$

17. The factorization of  $-x^2 + 4$  is :

a) Prime

b)  $(x+2)^2$

c)  $(x-2)^2$

d)  $-(x-2)(x+2)$

$-x^2 + 4 = 4 - x^2$

فككها  
 (د)

$= (2-x)(2+x)$

لا يوجد صيغتين

$= -(-2+x)(2+x) = -(x-2)(x+2)$

18. The opposite of  $x-2$  is: 8

- a)  $-x-2$       b)  ~~$x+2$~~       c) 2-x      d)  $2x$

opposite:

الضرب بالـ  $-1$   
(اضرب بالـ  $-1$ )

$$-\overbrace{(x-2)} = -\overbrace{x+2} = 2-x$$

19. The reciprocal of  $x-2$  is:

- a)  $x-2$       b)  $2-x$       c)  $\frac{1}{x-2}$       d)  $\frac{1}{x}-2$

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

القلب العكس

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

20. The degree of the polynomial  $7x^4 - x^5 + 16$  is:

- a) 7      b) 16      c) 5      d) 4

degree:  $\rightarrow$  الحد الأعلى

21. One of the following ordered pairs is a solution for the equation  $y = \frac{1}{3}x - 2$ :

9

a)  $(3, -1)$

b)  $(\frac{1}{3}, -2)$

c)  $(-2, 0)$

d)  $(1, -\frac{1}{3})$

لكل هذا السؤال : يجب تصويب قيم  $x$  وقيم  $y$   
وتجريب جميع الخيارات (التي يجعل طرفي المعادلتين متساويين) هو الحل الصحيح

a)  $(\underset{x}{3}, \underset{y}{-1})$  :  $y = \frac{1}{3}x - 2$

$-1 = \frac{1}{3}(3) - 2$  → by calculator

$-1 = -1$  ✓

b)  $(\underset{x}{\frac{1}{3}}, \underset{y}{-2})$  :  $y = \frac{1}{3}x - 2$

$-2 = \frac{1}{3} \cdot \frac{1}{3} - 2$  → by calculator

$-2 = -\frac{17}{9}$  ✗

c)  $(\underset{x}{-2}, \underset{y}{0})$  :  $y = \frac{1}{3}x - 2$

$0 = \frac{1}{3}(-2) - 2$  → by calculator

$0 = -\frac{8}{3}$  ✗

d)  $(\underset{x}{1}, \underset{y}{-\frac{1}{3}})$  :  $y = \frac{1}{3}x - 2$

$-\frac{1}{3} = \frac{1}{3}(1) - 2$  → by calculator

$-\frac{1}{3} = -\frac{5}{3}$  ✗

22) The result of  $(x^3 - y^2)(x^3 + y^2)$  is:

10

- a)  $x^6 - y^4$       b)  $x^6$       c)  $2x^3 - 2y^2$       d)  $2x^3$

$$(x^3 - y^2)(x^3 + y^2) = x^6 + \cancel{x^3y} - \cancel{yx^3} - y^4$$
$$= x^6 - y^4$$

23. The set of numbers for which the rational expression

$$\frac{(x+5)(x-2)}{(x-1)(x+4)}$$
 is not defined.

- a)  $\{-1, 4\}$       b)  $\{-2, 5\}$       c)  $\{-4, 1\}$       d)  $\{-5, 2\}$

not defined:  $\text{مقسوم عليه} = 0$

$$(x-1)(x+4) = 0$$

$$x-1 = 0 \mid x+4 = 0$$

$$\underline{x=1} \quad \underline{x=-4}$$

24. The solution of  $2(x-3) = 2x-6$  is:

- a) all real numbers      b)  $\emptyset$       c) 2      d) 3

$$2(x-3) = 2x-6$$

$$2x - \cancel{6} = 2x - 6$$

$$2x - 2x = -6 + 6$$

all real numbers  $\boxed{0=0}$

25) The solution of  $2(x-3) = 2x-3$  is:

11

- a) all real numbers    b) -3    c) 2    **d)  $\emptyset$**

$$2(x-3) = 2x-3$$

$$2x - 6 = 2x - 3$$

$$2x - 2x = -3 + 6$$

No Solution  $\emptyset$   $\leftarrow$   $\boxed{0 = 3}$

26. GCF ( $x^2, x^2-1$ ) = :

- a)  $x^2$     b)  $x^2(x^2-1)$     c) 0    **d) 1**

$$x^2 = x^2$$

$$x^2 - 1 = (x-1)(x+1)$$

الاستيعاب المشترك: لا يوجد

$$\boxed{\text{GCF} = 1}$$

27. LCM ( $x^2, x^2-1$ ) = :

- a)  $x^2$     b)  $x^2(x^2-1)$     c) 0    d) 1

جميع العوامل:  $x, (x-1), (x+1)$

الأسس الأعلى:  $x^2, (x-1)^1, (x+1)^1$

$$\text{LCM} = x^2(x-1)(x+1)$$

$$= x^2(x^2-1) = x^4 - x^2$$

$$\begin{aligned} & \boxed{(x-1)(x+1)} \\ & x^2 + x - x - 1 \\ & x^2 - 1 \end{aligned}$$

28) The result of  $(x-2y)^2 - 4y^2$  is: 12

- a)  $x^2 - 4xy + 8y^2$    b)  $x^2$    c)  $x^2 - 4xy$    d)  $x^2 - 8y^2$

method 1 :

$$(x-2y)^2 - 4y^2$$

$$x^2 - 4xy + \cancel{4y^2} - \cancel{4y^2}$$

$$= \boxed{x^2 - 4xy}$$

$$\begin{aligned} & (x-2y)^2 \\ &= (x-2y)(x-2y) \\ &= x^2 - \underline{2xy} - \underline{2xy} + 4y^2 \\ &= x^2 - 4xy + 4y^2 \end{aligned}$$

method 2 :

$$(x-2y)^2 - 4y^2$$

$$[(x-2y) - 2y][(x-2y) + 2y]$$

$$(x-2y-2y)(x-2y+2y)$$

$$(x-4y)(x) = x(x-4y) \rightarrow \text{factorization}$$
$$\underline{x^2 - 4xy}$$

29. If 25% of what number is 10, then 65% of the same number is :

13

- a) 20      b) 10      c) 26      d) 40

1) Sol :  $0.25(x) = 10$

$$x = \frac{10}{0.25} = 40$$

$$\begin{aligned} 25\% &= \frac{25}{100} \\ &= 0.25 \end{aligned}$$

2) Sol :  $0.65(40) = \boxed{26}$

$$65\% = \frac{65}{100} = 0.65$$

30. The interval notation for the set  $\{x \mid x \geq 2\}$  is :

- a)  $(2, \infty)$       b)  $[-2, 2]$       c)  $(-\infty, 2]$       d)  $[2, \infty)$

$x > \text{number} : (\text{number}, \infty)$

$x \geq \text{number} : [\text{number}, \infty)$

$x < \text{number} : (-\infty, \text{number})$

$x \leq \text{number} : (-\infty, \text{number}]$

$x > 2$	$(2, \infty)$	$x > -2$	<del><math>(-\infty, -2)</math></del> $(-2, \infty)$
$x \geq 2$	$[2, \infty)$	$x \geq -2$	<del><math>(-\infty, -2]</math></del> $[-2, \infty)$
$x < 2$	$(-\infty, 2)$	$x < -2$	$(-\infty, -2)$
$x \leq 2$	$(-\infty, 2]$	$x \leq -2$	$(-\infty, -2]$



31. The slope of the line  $y = 2 - 3x$  is:

- a) 2
- b) 3
- c) -3**
- d) 0

Slope  $\times$  abla

$y = 5 + 3x$  : slope = 3

$y = \frac{2-x}{4}$  : Slope =  $-\frac{1}{4}$

$y = \frac{3}{2}x - 1$  : Slope =  $\frac{3}{2}$

$2x + 3y = 5$  slope  $\rightarrow$

من اى y على اليا برد الباقي للسبت

$3y = 5 - 2x$

$y = \frac{5 - 2x}{3}$

Slope =  $-\frac{2}{3}$

32. The slope of the line  $x = 2 - 3y$  is

- a) -3
- b) 2
- c)  $\frac{1}{3}$
- d)  $-\frac{1}{3}$**

$x = 2 - 3y$

$3y = 2 - x$

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

Slope =  $-\frac{1}{3}$

32.

15

سكنه فهدراً عند ايمبار Slope

$$y = 3x + 2 \Rightarrow \text{Slope} = 3$$

معامل x

$$x = 3y + 2 \quad \text{slope} \neq 3$$

جب بعد ياتى اليمبار

$$-3y = 2 - x$$

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

$$\text{Slope} = \frac{-1}{-3} = +\frac{1}{3}$$

$$33. (-5x^3y^5z^2)^4 =$$

$$\text{a) } 625x^{12}y^{20}z^8$$

$$\text{b) } 20x^7y^9z^6$$

$$\text{c) } -625x^{12}y^{20}z^8$$

$$\text{d) } -20x^7y^9z^6$$

$$(-5x^3y^5z^2)^4 = (-5)^4 x^{12} y^{20} z^8$$

$$= 625x^{12}y^{20}z^8$$

أ ضرب اليمبار

ج لا تنسى وضع اليمبار

الاقتراس

34. One of the following is a vertical 16 line :

a)  $y = 4$

b)  $y = 2x - 1$

c)  $y = x$

d)  $x = -3$

Vertical line : يعبره x فقط

horizontal line : يعبره y فقط

---

35. The translation of "two hundreds less than the product of two numbers" is :

a)  $200 - xy$

b)  $200xy$

c)  $xy - 200$

d)  $xy + 200$

$xy$  : ما بعد يأتي اولاً less

$200$  : ما قبل ~~less~~ يأتي ثانياً

$xy - 200$

36. The set of numbers for which

17

the rational expression  $\frac{x-8}{x^2-25}$  is not defined:

- a)  $[-25, 25]$     b)  $[-12.5, 12.5]$     c)  $\{-5, 5\}$     d)  $\{8\}$

not defined: المقادير التي تجعل

$$x^2 - 25 = 0$$

$$x^2 = 25$$

$$x = \pm\sqrt{25} = \pm 5$$

37. One of the following is a perfect square:

- a)  $x^2 + 5x + 4$     b)  $x^2 - 5x + 1$     c)  $x^2 + 4$     d)  $x^2 + 6x + 9$

perfect square:  $[x^2 + 6x + 9 = (x+3)^2]$   $\left[ \begin{array}{l} \text{مربع كامل} \\ \text{مربع كامل} \\ \text{مربع كامل} \end{array} \right]$

a)  $x^2 + 5x + 4$  :  $\sqrt{x^2} = x / \sqrt{4} = 2 / 2 \cdot x \cdot 2 = 4x$  (المكامل  $5x$ )  
الاجاب  $x$

b)  $x^2 - 5x + 1$  :  $\sqrt{x^2} = x / \sqrt{1} = 1 / 2 \cdot x \cdot 1 = 2x$  (المكامل  $5x$ )  
الاجاب  $x$

c)  $x^2 + 4$  :  $\sqrt{x^2} = x / \sqrt{4} = 2 / 2 \cdot x \cdot 2 = 4x$  (المكامل  $4$ )  
الاجاب  $x$

d)  $x^2 + 6x + 9$  :  $\sqrt{x^2} = x / \sqrt{9} = 3 / 2 \cdot x \cdot 3 = 6x$  (المكامل  $6x$ )  
الاجاب  $x$

38. The fraction  $\frac{y}{9x}$  is equivalent to  $\frac{7}{9}$  115  
when  $y =$

a) 7

b) 9

c)  $7x$

d)  $9x$

equivalent:

متساويان

$$\frac{y}{9x} = \frac{7}{9}$$

$$: 9y = 63x$$

$$y = \frac{63x}{9} = 7x$$

---

39. what percent of 125 is 30?

a) 24%

b) 45%

c) 4.17%

d) 24%

$$\frac{x}{100} \cdot 125 = 30$$

$$\frac{125}{100} x = 30$$

$$x = \left( 30 \div \frac{125}{100} \right) = 24$$

① Solve the following equations:

$$\textcircled{1} \quad 2x^2 - 8 = 0$$

method 1:  $2(x^2 - 4) = 0$   
 $2(x-2)(x+2) = 0$

$$\begin{array}{c|c|c} 2 = 0 & x - 2 = 0 & x + 2 = 0 \\ \hline x & \underline{x = 2} & \underline{x = -2} \end{array}$$

S. S :  $\{-2, 2\}$

---

method 2:

$$2x^2 = 8$$

$$x^2 = \frac{8}{2}$$

$$\boxed{x^2 = 4}$$

$$x = \pm\sqrt{4} = \pm 2$$

$$\textcircled{2} \quad \text{Solve } 3x^2 - x - 4 = 0$$

$$(3x-4)(x+1) = 0$$

$$\begin{array}{c|c} 3x - 4 = 0 & x + 1 = 0 \\ \hline 3x = 4 & \underline{x = -1} \\ \underline{x = \frac{4}{3}} & \end{array}$$

S. S :  $\{-1, \frac{4}{3}\}$

{ calculator mode  $\Rightarrow$  S  $\Rightarrow$  }

$$\begin{array}{l} x_1 = \frac{4}{3} \rightarrow (3x-4) \\ x_2 = -1 \rightarrow (x+1) \end{array}$$

③ Solve  $6x^2 - 9x - 15 = 0$

لليجوز استخدام Calculator مباشرة

بسبب رموزها المتكررة

$$3(2x^2 - 3x - 5) = 0$$

استخدم Calculator

$$3(2x - 5)(x + 1) = 0$$

$3 = 0$	$2x - 5 = 0$	$x + 1 = 0$
$x$	$2x = 5$	$x = -1$
	$x = \frac{5}{2}$	

$x_1 = \frac{5}{2}$
$(2x - 5)$
$x_2 = -1$
$(x + 1)$

S.S:  $\left\{ \frac{5}{2}, -1 \right\}$

④ Solve  $x^2 - 2x = 2x^2 + 4x + 9$

$$\underline{x^2} - 2x - \underline{2x^2} - 4x - 9 = 0$$

$$-x^2 - 6x - 9 = 0$$

$$x^2 + 6x + 9 = 0$$

$$(x + 3)(x + 3) = 0$$

$$x + 3 = 0$$

$x = -3$

في حال كان معامل  $x^2$  سالب  
اضرب الثابت بسالب  
(غيراً إشارة كل المتاديين)

Calculator

$$x = -3$$

$$(x + 3)$$

⑤ Solve  $(x-2)^2 - 25 = 0$

$$(x-2)^2 = 25$$

$$(x-2) = \pm \sqrt{25}$$

$$x-2 = \pm 5$$

$$x = 2 \pm 5$$

$$x = 2 - 5 = -3$$

$$x = 2 + 5 = 7$$

$$S.S : \{-3, 7\}$$

---

⑥ Solve  $3(x+1)^2 = 27$

$$(x+1)^2 = \frac{27}{3} = 9$$

$$x+1 = \pm \sqrt{9}$$

$$x+1 = \pm 3$$

$$x = -1 \pm 3$$

$$x = -1 + 3 = 2$$

$$x = -1 - 3 = -4$$

$$S.S : \{-4, 2\}$$



$$\textcircled{7} \quad 3x^3 - 27x = x^2 - 9$$

$$\underbrace{3x^3 - 27x} - \underbrace{x^2 + 9} = 0$$

$$3x \underbrace{(x^2 - 9)} - 1 \underbrace{(x^2 - 9)} = 0$$

$$\underbrace{(x^2 - 9)} (3x - 1) = 0$$

~~$x$~~   ~~$3$~~

$$(x - 3)(x + 3)(3x - 1) = 0$$

$$\begin{array}{l|l|l} x - 3 = 0 & x + 3 = 0 & 3x - 1 = 0 \\ \hline \underline{x = 3} & \underline{x = -3} & 3x = 1 \\ & & x = \frac{1}{3} \end{array}$$

$$S.S : \left\{ 3, -3, \frac{1}{3} \right\}$$

2 Factor the following:

①  $6x^2 + x - 2$

$6x^2 + 4x - 3x - 2$

$2x(3x+2) - 1(3x+2)$

$= (3x+2)(2x-1)$

(ac-method)

$ac : -12$

$b : +1$

---

<u>a</u>	<u>b</u>	<u>c</u>
1	1	-12
		-4, 3
		4, -3

②  $6x^2 - 4x - 2$

اولاً نقسم على 2

$2(3x^2 - 2x - 1)$

الآن استخدم a-c method  
Calculator

$2(x-1)(3x+1)$

(ac-method)

~~$3x^2 - 2x - 1$~~

mode  $\Rightarrow s \Rightarrow 3$

<u>a</u>	<u>b</u>	<u>c</u>
$\frac{a}{3}$	$-\frac{b}{2}$	$\frac{c}{-1}$

$x = 1, x = -\frac{1}{3}$

$(x-1) (3x+1)$

$$\underline{ac} : 6x^2 - 4x - 2$$

$$2(3x^2 - 2x - 1)$$

$$= 2(x-1)(3x+1)$$

$$\left. \begin{array}{l} \overset{\curvearrowright}{3x^2 - 2x - 1} \\ 3x^2 - 3x + x - 1 \\ \underline{3x(x-1) + 1(x-1)} \\ (x-1)(3x+1) \end{array} \right\} \begin{array}{l} ac: -3 \\ b: -2 \\ \hline -3, 1 \end{array}$$

$$\underbrace{xy - x} - \underbrace{y^2 + y}$$

(Grouping)

$$\underbrace{x(y-1)} - \underbrace{y(y-1)}$$

$$(y-1)(x-y)$$

$$2x^3y^2 + 10x^2y^2 + 12xy^2$$

(عامة مشترك)

$$2xy^2(x^2 + 5x + 6)$$

$$2xy^2(x+2)(x+3)$$

3 Simplify the following Expressions.

①  $\frac{x^2 - 4}{x^2 - 5x + 6} \cdot \frac{x^2 - 6x + 9}{x^2 + 2x}$

*calculator*  $\frac{x^2 - 4}{x^2 - 5x + 6}$        $\frac{x^2 - 6x + 9}{x^2 + 2x}$  *calculator*      *عاطف مشترك*

(Factoring) *عاطف مشترك*

$$\frac{(x-2)(x+2)}{(x-2)(x-3)} \cdot \frac{(x-3)(x-3)}{x(x+2)} = \boxed{\frac{x-3}{x}}$$

②  $\frac{x^2 - 9}{25x^2 - 4} \cdot \frac{2 - 5x}{27 - 3x}$

*عاطف مشترك*

$$\frac{(x-3)(x+3)}{(5x-2)(5x+2)} \cdot \frac{(2-5x)}{3(9-x^2)}$$

$$= \frac{\overset{-1}{(x-3)} \cancel{(x+3)}}{\cancel{(5x-2)}(5x+2)} \cdot \frac{\overset{-1}{(2-5x)}}{3(\cancel{3-x})(\cancel{3+x})}$$

$$= \frac{-1 \cdot -1}{(5x+2) \cdot 3} = \frac{1}{3(5x+2)}$$

*لايف*

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

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

3

$$\frac{9x^2 - 1}{x^2 - 2x + 1} \div \frac{2 - 6x}{x^3 - x}$$

حول (÷) الى (·)

راقب الأسر الموصولة بعد (÷)

$$\frac{9x^2 - 1}{x^2 - 2x + 1} \cdot \frac{x^3 - x}{2 - 6x}$$

← 3x  
← 2  
← 1

← 3  
← 2  
← 1

← 2  
← 6x

← 2  
← 6x

$$= \frac{(3x-1)(3x+1)}{(x-1)(x-1)} \cdot \frac{x(x^2-1)}{2(1-3x)}$$

$$= \frac{(3x-1)(3x+1)}{(x-1)(x-1)} \cdot \frac{x(x-1)(x+1)}{2(1-3x)}$$

$$= \frac{-x(3x+1)(x+1)}{2(x-1)}$$

دیکھا گیا  
④

$$\frac{3x^2 - 27}{-x^2 - x}$$

÷

$$\frac{x^2 - 6x + 9}{2x^2 + 4x + 2} \rightarrow \text{Calc}$$

دیکھا گیا

$$\frac{3(x^2 - 9)}{-x(x+1)}$$

$$\cdot \frac{2(x^2 + 2x + 1)}{(x-3)(x-3)} \rightarrow \text{Calc}$$

$$\frac{3(x-3)(x+3)}{-x(x+1)}$$

$$\cdot \frac{2(x+1)(x+1)}{(x-3)(x-3)}$$

$$= \frac{2 \cdot 3 \cdot (x+3)(x+1)}{-x(x-3)}$$

$$= \boxed{\frac{6(x+3)(x+1)}{-x(x-3)}}$$

⑤

$$\frac{(x+1)^2}{(x-1)^2}$$

$$\cdot \frac{x^2 - 1}{x^2 + 1} \rightarrow \text{prime}$$

$$\frac{(x+1)(x+1)}{(x-1)(x-1)}$$

$$\cdot \frac{(x-1)(x+1)}{(x^2+1)}$$

$$= \boxed{\frac{(x+1)^3}{(x-1)(x^2+1)}}$$

Solve the following

4

$$x^3 = x^5$$

$$x^3 - x^5 = 0$$

$$x^3(1-x^2) = 0$$

$$x^3(1-x)(1+x) = 0$$

$$x^3 = 0 \quad \left| \begin{array}{l} 1-x=0 \\ 1+x=0 \end{array} \right. \quad \left| \begin{array}{l} 1+x=0 \\ x=-1 \end{array} \right.$$

$$\underline{x=0}$$

$$S.S : \{0, 1, -1\}$$

5

$$3(x-2)^2 = 0$$

$$3=0 \quad \left| \begin{array}{l} (x-2)^2 = 0 \\ x-2 = 0 \\ x=2 \end{array} \right.$$

$$S.S : \{2\}$$

$$x^2 \cdot x^2 - 16 = 0$$

$$(x^2-4)(x^2+4) = 0$$

$$(x-2)(x+2)(x^2+4) = 0$$

$$x-2=0 \quad \left| \begin{array}{l} x+2=0 \\ x=-2 \end{array} \right. \quad \left| \begin{array}{l} x^2+4=0 \\ x \end{array} \right.$$

$$\underline{x=2}$$

$$\underline{x=-2}$$

$$S.S : \{-2, 2\}$$