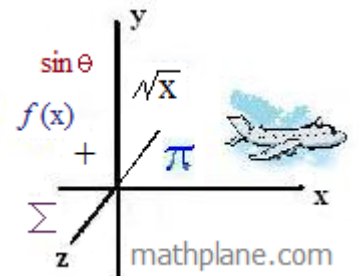


Algebra I

Review Test 007

(and solutions)

24 questions include exponents, graphs, linear systems, Venn Diagram, inequalities, absolute value, factoring, and more...



Math 007 Review Practice

1) a) Evaluate the expression $x^3 + 3x - 4y$ if $x = -1$ and $y = 2$

b) Simplify $7n - [3(2n - 4) + 5]$

2) Simplify; (do not use negative exponents in your final answers)

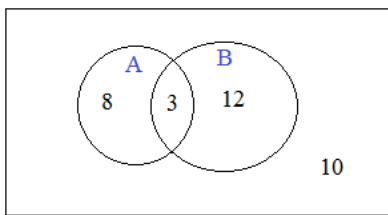
a) $\frac{15xy^4}{-5x^3y^2}$

b) $(7a^3b^{-2})(2a^5b)$

c) $(8m^6)^{\frac{2}{3}}$

d) $\frac{-(2x^2y)^2}{3x^5y}$

3) Answer for the following Venn Diagram



a) $A =$

b) $A \cup B =$

c) $A \cap B =$

d) $\overline{B} =$

4) For the given graph, find each of the following:

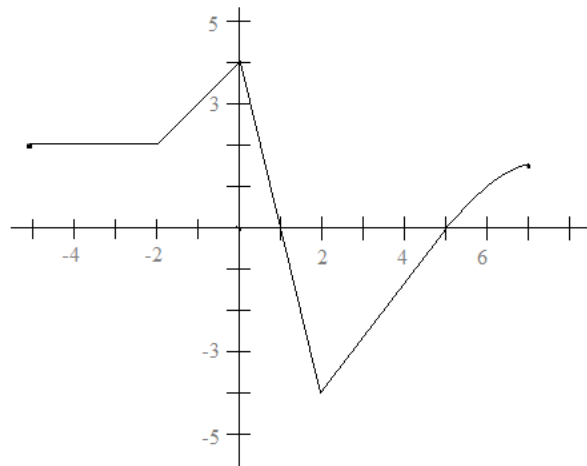
a) $f(-3)$

b) the domain of f

c) all x where $f(x) = 0$

d) the (approximate) range of f

e) all x where $f(x) = 2$



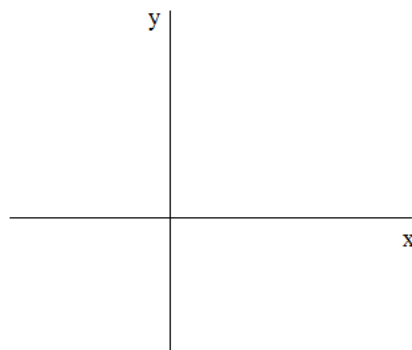
5) After the 20% discount, a jacket cost \$57. What was the original price of the jacket?

Math 007 Review Practice

6) Write the equation of a line containing the points $(2, -3)$ and $(5, 6)$. What is the x-intercept? What is the y-intercept?

7) Solve the following system: $2x + 5y = -10$
 $6x + 4y = 14$

8) Sketch the following system: $x < 6$
 $y \geq 2x - 3$



9) The difference between two integers is 43. If you double the smaller integer and triple the larger integer, their sum is 189. Identify the two integers.

10) Solve for each:

a) $|x + 4| = 14$

b) $|y + 2| + 5 = 8$

c) $|3n - 2| + 9 = 8$

d) $3|x + 4| = 6$

Math 007 Review Practice

11) Solve $(x + 2) - 16 < 4(x - 3)$. Write the solution using interval notation.

12) Factor

a) $x^2 - 8x + 7$

b) $9 - 4z^2$

c) $2y^2 + 10y - 28$

13) Solve

a) $x^2 + 6x = 7$

b) $x^3 - 9x = 0$

c) $x^2 + 5x - 8 = 0$

14) Expand the given polynomial: $(x^2 - 2)(x^2 + 2x + 1)$

a) What is the degree of the polynomial?

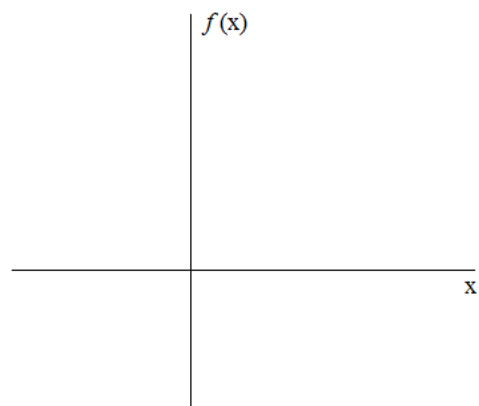
b) Arrange the terms in descending order.

c) What is the leading coefficient?

d) Evaluate the polynomial at $x = 1$

15) Graph the following function $f(x) = 2x^2 - 13x + 15$

Identify the y-intercept, zeros, and vertex.



Math 007 Review Practice

16) Rationalize each denominator.

a) $\frac{6}{\sqrt{7}}$

b) $\frac{-2}{3 + \sqrt{5}}$

17) Solve

$$\frac{x}{x+3} + \frac{5}{x-1} = \frac{x+25}{x^2+2x-3}$$

18) Answer (leaving answers in $a + bi$ form)

a) $4 + i - (2 - 3i)$

b) $(3 - i)(2 + 5i)$

c) $(4 + 7i)^2$

19) The *diagonal* of a rectangle is 15 feet. If one of the sides is 9 feet, what is the area of the rectangle?

20) Solve

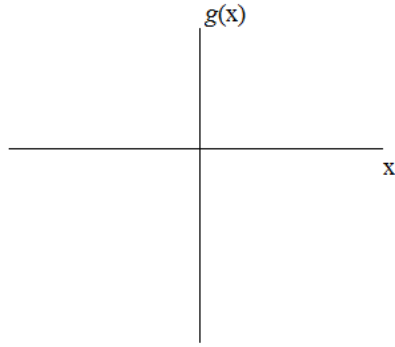
$$\sqrt{4x+41} = x+5 \quad (\text{Identify any extraneous solutions})$$

Math 007 Review Practice

21) Sketch a graph of the following: $g(x) = 2(x + 1)^2 - 8$

Identify:

- a) the vertex
- b) y-intercept
- c) x-intercepts



22) Simplify

a) $\sqrt[3]{32}$

b) $\sqrt{27} - \sqrt{12}$

c) $(3 + 2\sqrt{5})(1 + \sqrt{5})$

23) Tom can paint 3 fences in 8 hours. And, Jerry can paint 3 fences in 5 hours. Working together, how long would it take Tom and Jerry to paint 3 fences?

24) Let $f(x) = 2x^2 - 10x + 8$

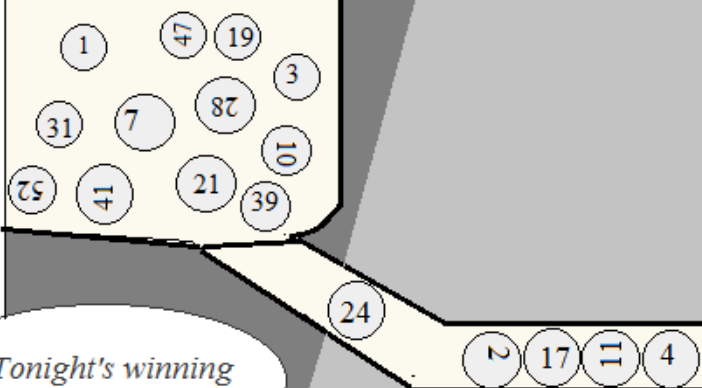
a) Find $f(-2)$

b) Find $f(n)$

c) What is the vertex of the graph $y = f(x)$?

d) Is the vertex is a minimum or a maximum?

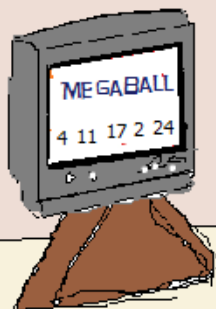
Lottery



MEGABALL
Superdraw!

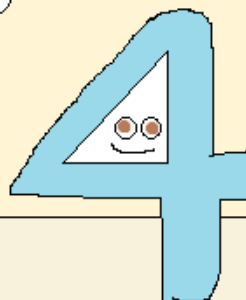
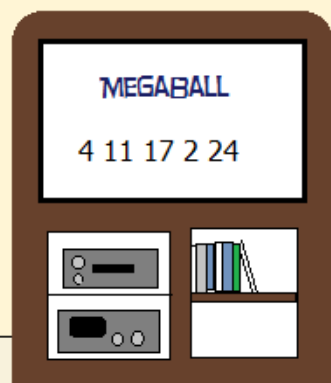
"Tonight's winning numbers are"

"We won! We won!"



Fortune....

"We're on TV!
We're on TV!"



*...and,
Fame.*

1) a) Evaluate the expression $x^3 + 3x - 4y$ if $x = -1$ and $y = 2$ $(-1)^3 + 3(-1) - 4(2) = -1 - 3 - 8 = -12$

b) Simplify $7n - [3(2n - 4) + 5]$ $7n - [6n - 12 + 5] = 7n - 6n + 12 - 5 = n + 7$

2) Simplify; (do not use negative exponents in your final answers)

a) $\frac{15xy^4}{-5x^3y^2}$

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

b) $(7a^3b^{-2})(2a^5b)$

$14a^8b^{-1} = \frac{14a^8}{b}$

c) $(8m^6)^{\frac{2}{3}}$

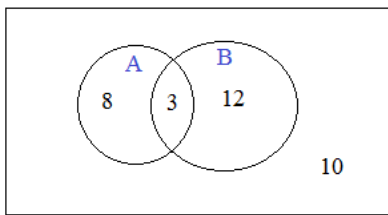
$\frac{2}{3} = 4$
 $(m^6)^{\frac{2}{3}} = m^{\frac{12}{3}}$

$4m^4$

d) $\frac{-(2x^2y)^2}{3x^5y} = \frac{-(4x^4y^2)}{3x^5y}$

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

3) Answer for the following Venn Diagram



a) $A = 11$

b) $A \cup B = 23$

c) $A \cap B = 3$

d) $\overline{B} = 18$ $\overline{B} =$ All terms that are not in B

4) For the given graph, find each of the following:

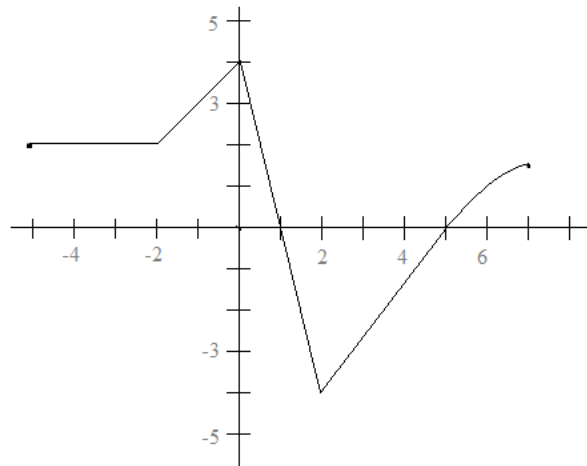
a) $f(-3) = 2$

b) the domain of f $[-5, 7]$

c) all x where $f(x) = 0$ the zeros are $x = 1, 5$

d) the (approximate) range of f $[-4, 4]$

e) all x where $f(x) = 2$ in the interval $[-5, -2]$



5) After the 20% discount, a jacket cost \$57. What was the original price of the jacket?

$J =$ original cost of the Jacket

$.20J =$ amount of discount

$J - .20J = \$57$

$.80J = \$57$

$J = \$71.25$

11) Solve $(x + 2) - 16 < 4(x - 3)$. Write the solution using interval notation.

$$x - 14 < 4x - 12$$

$$-2 < 3x$$

$$x > -2/3$$

$$(-2/3, \infty)$$

12) Factor

a) $x^2 - 8x + 7$

$$(x - 1)(x - 7)$$

b) $9 - 4z^2$

(difference of squares)

$$(3 + 2z)(3 - 2z)$$

c) $2y^2 + 10y - 28$

(greatest common factor is 2)

$$2(y^2 + 5y - 14)$$

$$2(y + 7)(y - 2)$$

13) Solve

a) $x^2 + 6x = 7$

$$x^2 + 6x - 7 = 0$$

$$(x + 7)(x - 1) = 0$$

$$x = -7, 1$$

b) $x^3 - 9x = 0$

$$x(x^2 - 9) = 0$$

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

$$x = -3, 0, 3$$

c) $x^2 + 5x - 8 = 0$

Use quadratic formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-5 \pm \sqrt{(5)^2 - 4(1)(-8)}}{2(1)}$$

$$= \frac{-5 + \sqrt{57}}{2} \text{ and } \frac{-5 - \sqrt{57}}{2}$$

14) Expand the given polynomial: $(x^2 - 2)(x^2 + 2x + 1)$

a) What is the degree of the polynomial? 4

b) Arrange the terms in descending order. $x^4 + 2x^3 - x^2 - 4x - 2$

c) What is the leading coefficient? 1

d) Evaluate the polynomial at $x = 1$ -4

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

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

15) Graph the following function $f(x) = 2x^2 - 13x + 15$

Identify the y-intercept, zeros, and vertex.

y-intercept: $f(0) = 0 - 0 + 15$ $(0, 15)$

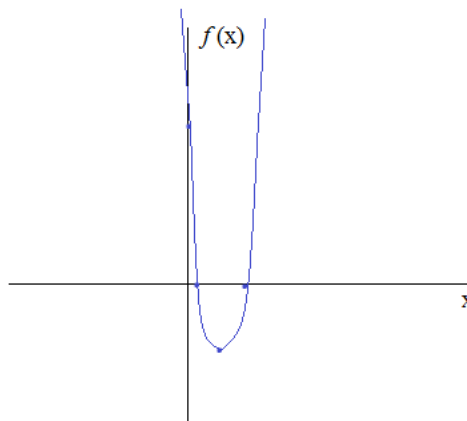
x-intercepts: x values where $f(x) = 0$
(zeros)

$$0 = 2x^2 - 13x + 15$$

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

$$x = 5, 3/2$$

vertex: $(\frac{-b}{2a}, f(\frac{-b}{2a}))$ $(13/4, -49/8)$



16) Rationalize each denominator.

$$\text{a) } \frac{6}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}}$$

$$= \frac{6\sqrt{7}}{7}$$

$$\text{b) } \frac{-2}{3+\sqrt{5}} \cdot \frac{(3-\sqrt{5})}{(3-\sqrt{5})}$$

$$= \frac{-6+2\sqrt{5}}{4} = \frac{-3+\sqrt{5}}{2}$$

17) Solve

$$\frac{x}{x+3} + \frac{5}{x-1} = \frac{x+25}{x^2+2x-3}$$

$$\frac{x(x-1)}{(x+3)(x-1)} + \frac{5(x+3)}{(x-1)(x+3)} = \frac{x+25}{(x-1)(x+3)}$$

$$\frac{x^2-x+5x+15}{(x+3)(x-1)} = \frac{x+25}{(x-1)(x+3)}$$

$$x^2+4x+15 = x+25$$

$$x^2+3x-10=0$$

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

$$x = -5, 2$$

$$\text{check } -5: \frac{-5}{-2} + \frac{5}{-6} = \frac{20}{12}$$

$$\checkmark \frac{30}{12} + \frac{-10}{12} = \frac{20}{12}$$

$$\text{check } 2: \frac{2}{5} + \frac{5}{1} = \frac{27}{5}$$

$$\checkmark \frac{2}{5} + \frac{25}{5} = \frac{27}{5}$$

18) Answer (leaving answers in $a + bi$ form)

$$\text{a) } 4 + i - (2 - 3i)$$

$$4 + i - 2 + 3i$$

$$2 + 4i$$

$$\text{b) } (3 - i)(2 + 5i)$$

$$6 + 15i - 2i - 5i^2$$

$$6 + 13i - 5(-1)$$

$$11 + 13i$$

$$\text{c) } (4 + 7i)^2$$

$$(4 + 7i)(4 + 7i)$$

$$16 + 28i + 28i + 49i^2$$

$$-33 + 56i$$

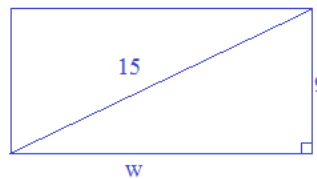
19) The *diagonal* of a rectangle is 15 feet. If one of the sides is 9 feet, what is the area of the rectangle?

(using pythagorean theorem)

$$9^2 + w^2 = (15)^2$$

$$w^2 = 225 - 81$$

$$w = 12$$

area of rectangle = $l \times w$

$$9 \times 12$$

$$= 108 \text{ sq. feet}$$

$$\text{20) Solve } \sqrt{4x+41} = x+5$$

(Identify any extraneous solutions)

(square both sides)

$$4x+41 = (x+5)(x+5)$$

$$4x+41 = x^2+10x+25$$

$$x^2+6x-16=0$$

$$(x+8)(x-2)=0$$

$$x = -8, 2$$

check solutions:

$$\sqrt{4(-8)+41} = -8+5$$

$$\sqrt{9} = -3$$

extraneous!!

$$\sqrt{4(2)+41} = (2)+5$$

$$\sqrt{49} = 7$$

$$7 = 7 \checkmark$$

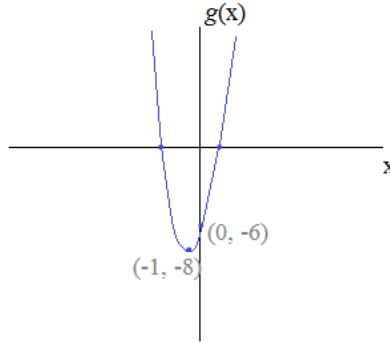
21) Sketch a graph of the following: $g(x) = 2(x + 1)^2 - 8$

Identify: $y = a(x - h)^2 + k$

a) the vertex $(h, k) = (-1, -8)$

b) y-intercept $g(0) = 2(0 + 1)^2 - 8$

c) x-intercepts $(0, -6)$



$$g(x) = 0$$

$$2(x + 1)^2 - 8 = 0$$

$$2x^2 + 4x + 2 - 8 = 0$$

$$2x^2 + 4x - 6 = 0$$

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

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

$$x = -3, 1$$

22) Simplify

a) $\sqrt[3]{32}$

$$\sqrt[3]{16 \cdot 2}$$

$$= 4\sqrt[3]{2}$$

b) $\sqrt[3]{27} - \sqrt[3]{12}$

$$3\sqrt[3]{3} - 2\sqrt[3]{3}$$

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

c) $(3 + 2\sqrt{5})(1 + \sqrt{5})$

(FOIL)

$$3 + 3\sqrt{5} + 2\sqrt{5} + 10 = 13 + 5\sqrt{5}$$

approx 24.18

23) Tom can paint 3 fences in 8 hours. And, Jerry can paint 3 fences in 5 hours. Working together, how long would it take Tom and Jerry to paint 3 fences?

Tom's rate: $\frac{3 \text{ fences}}{8 \text{ hours}}$

together: they'll paint for t hours
(tom) (jerry)

$$15 \text{ fences}(t) + 24 \text{ fences}(t) = 120 \text{ hours(fences)}$$

Jerry's rate: $\frac{3 \text{ fences}}{5 \text{ hours}}$

$$\frac{3 \text{ fences}}{8 \text{ hours}} t + \frac{3 \text{ fences}}{5 \text{ hours}} t = 3 \text{ fences}$$

$$39t = 120 \text{ hours}$$

(multiply by 40 hours)

$$t = \frac{40}{13} \text{ hours}$$

or 3 hours 5 minutes

$$\frac{120 \text{ hours(fences)}t}{8 \text{ hours}} + \frac{120 \text{ hours(fences)}t}{5 \text{ hours}} = 120 \text{ hours(fences)}$$

24) Let $f(x) = 2x^2 - 10x + 8$

Check: Tom:

$$\frac{40}{13} \text{ hours} (3 \text{ fences}/8 \text{ hours}) = 1.15 \text{ fences}$$

a) Find $f(-2)$ $2(-2)^2 - 10(-2) + 8 = 36$

Jerry:

$$\frac{40}{13} \text{ hours} (3 \text{ fences}/5 \text{ hours}) = 1.85 \text{ fences}$$

b) Find $f(n)$ $2n^2 - 10n + 8$

c) What is the vertex of the graph $y = f(x)$?

$$\frac{-b}{2a} = \frac{-(-10)}{2(2)} = \frac{5}{2} \quad f(5/2) = 50/4 - 50/2 + 8 = -18/4 = -9/2$$

$$\left(\frac{5}{2}, \frac{-9}{2} \right)$$

d) Is the vertex is a minimum or a maximum?

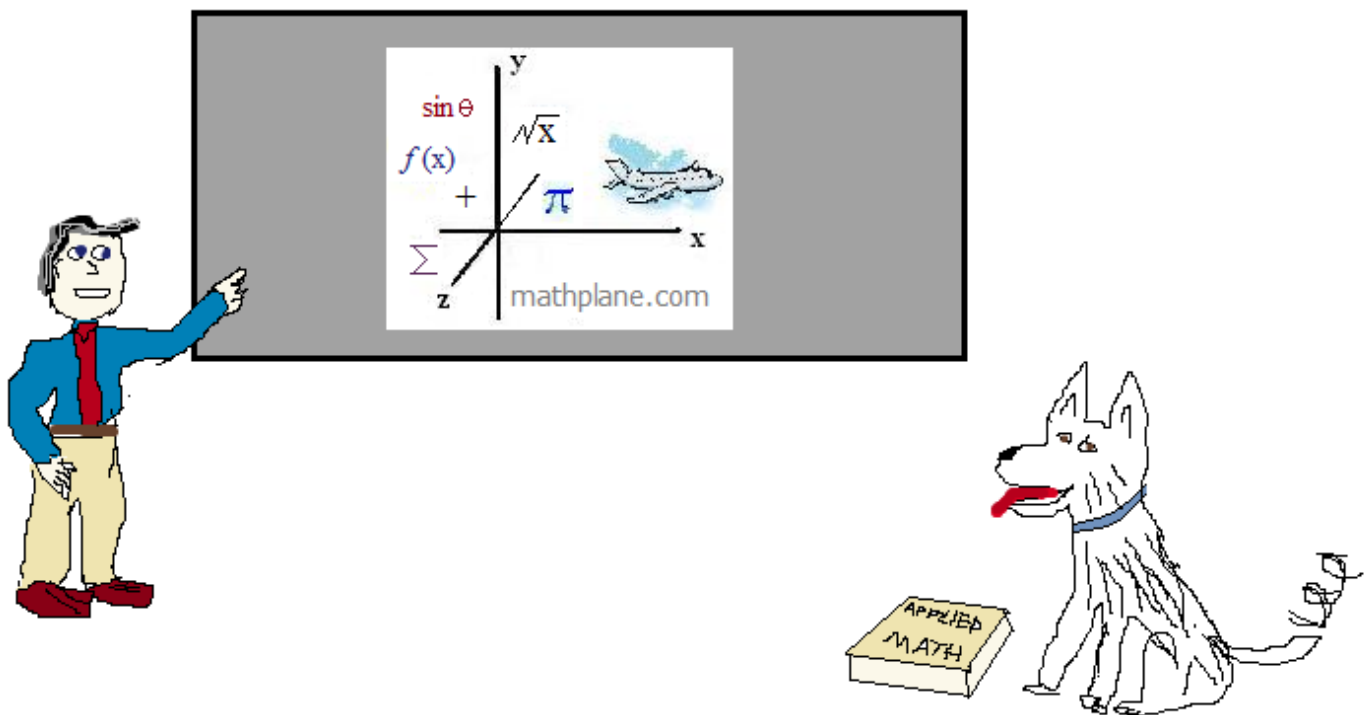
minimum

(since coefficient of lead term is 2 (> 0), the graph faces up....)

Thanks for visiting. (Hope it helped!)

If you have questions, suggestions, or requests, let us know.

Enjoy



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