ODM Review Units 1-3

A

J(2, -3), K(-1, 2), L(-3, 4)

Solve

$$\sqrt{9x-20} = x$$

$(\sqrt{9x-20})^2 = (x)^2$

$9x - 20 = x^2$

$0 = x^2 - 9x + 20$

$0 = (x-4)(x-5)$

$x = 4, 5$

check: $\sqrt{9(4)-20} = 4$ ✓

$\sqrt{9(5)-20} = 5$ ✓

M

4 and 5

Find an equation in point ratio form with the points (2, 9) and (3, 7.6). Round your "b" value to three places.

$x \quad y \quad x_1 \quad y_1$

$y = 7.6b^{2-3}$

$\frac{y}{7.6} = \frac{7.6b^{-1}}{7.6}$

$\left(\frac{y}{7.6}\right)^{-1} = \left(b^{-1}\right)^{-1}$

$b \approx .8444$ (store in calc)

$y = 7.6(.8444)^{0-3}$

$y = 12.62$

$y = 12.62(.8444)^x$

H $y = 12.62(.844)^x$

Pd-100 has a half-life of 6.3 days. If one had 2652 atoms the first day, how many atoms would be present after 20 days?

$y = 2652\left(\frac{1}{2}\right)^{20/6.3}$

$= 293.71$

D 293.71

Graph $y = x^2 - 6x - 7$.

Tell the vertex,
x-intercepts,
y-intercept,
and axis of symmetry.

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

x-int: $(7,0)$ $(-1,0)$

Vertex: $\frac{7+(-1)}{2} = 3$

$3^2 - 6(3) - 7 = -16$

V: $(3, -16)$

Axis of Sym: $x = 3$

y-int: $(0, -7)$

P

Vertex (3, 16)
Y-int (0, -7)
AoS: x = 3

Solve for x and y.

$$\left(\frac{3^x}{4^5}\right)^{-3} = \frac{4^y}{3^{18}}$$

$$\frac{3^{-3x}}{4^{-15}} = \frac{4^y}{3^{18}} \rightarrow \frac{4^{15}}{3^{3x}} = \frac{4^y}{3^{18}}$$

$y = 15$
$x = 6$

B

x = 6
y= 15

Factor and find the solutions.

$5 \cdot 3 = 15$
$5 + 3 = 8$

$5x^2 + 8x + 3 = 0$

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

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

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

$5x + 3 = 0$
$5x = -3$
$x = -3/5$

$x = -1$

L -3/5 or -1

Find the discriminant and tell the number/type of solutions.

$3b^2 + 4b - 2 = 0$

$b^2 - 4ac$

$(4)^2 - 4(3)(-2)$

$16 + 24 = \boxed{40}$

+, so 2 real solutions

Also irrational b/c it is not a perfect square.

C 40, 2 irrational solutions

The following function models how much money a certain company makes after a certain amount of time in months. During what month did they make the least amount of money?

$v(t) = 400 - 12t + .3t^2$

use calculator to find x value of the minimum

20 months

K 20

Find the vertices of triangle JKL with a 90° rotation.

J(3, -2), K(-4, -6), L(0, -5)

$(x,y) \rightarrow (-y,x)$

J(2, 3) K(6, -4) L(5, 0)

F (2, 3), (6, -4), (5, 0)

Find the exact values of the solutions

$8x^2 = 6x + 7$

$8x^2 - 6x - 7 = 0$

$$x = \frac{6 \pm \sqrt{36 - 4(8)(-7)}}{2(8)}$$

$$= \frac{6 \pm \sqrt{260}}{16}$$

$\sqrt{260}$

$26 \cdot 10$

$13 \cdot 2 \cdot 2 \cdot 5$

$2\sqrt{65}$

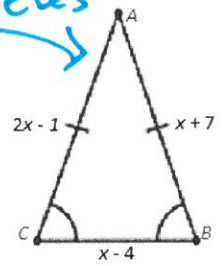
$$x = \frac{6 \pm 2\sqrt{65}}{16}$$

$$= \boxed{\frac{3 \pm \sqrt{65}}{8}}$$

O $\dfrac{3 \pm \sqrt{65}}{8}$

Solve for segment AC.

isosceles



$2x - 1 = x + 7$

$x = 8$

$AC = 2x - 1$

$2(8) - 1 = 15$

$AC = 15$

J 15

Solve

$$2(x+2)^{3/2} + 5 = 59$$

$\frac{2(x+2)^{3/2}}{2} = \frac{54}{2}$

$(x+2)^{3/2 \cdot 2/3} = 27^{2/3}$

$x + 2 = 27^{2/3}$

$x + 2 = 9$

$x = 7$

Check:

$2(7+2)^{3/2} + 5 = 59$ ✓

I	7

In 2012, you put $1200 into a savings account earning 6% annual interest. In what year will the account be worth $4000?

$4000 = 1200(1.06)^x$

$y_1 = y_2$

$x = 20.6$

$2012 + 20.6 = 2032.6$

In year 2032

E	2032

Describe how the parabola $y = -3(x + 5)^2 - 2$ is shifted from $y = x^2$.

Reflect over x-axis, vert. stretch by 3, left 5 and down 2

N Reflect over x-axis, vertical stretch by 3, left 5 and down 2

Solve the inequality.

$$0 \le 3x^2 - 16x + 5$$

$0 \le (3x^2 - 15x)(-x + 5)$

$0 \le 3x(x-5) - 1(x-5)$

$0 \le (3x-1)(x-5)$

$3x - 1 = 0$

$3x = 1$

$x = 1/3$ $\quad x = 5$

$3 \cdot 5 = 15$

$-1 - 15 = -16$

① $0 \le 3(0)^2 - 16(0) + 5$

$0 \le 5$ ✓

② $0 \le 3(1)^2 - 16(1) + 5$

$0 \le -8$ ✗

③ $0 \le 3(6)^2 - 16(6) + 5$

$0 \le 17$ ✓

$\{x \mid x \le 1/3 \text{ or } x \ge 5\}$

V $\{x \mid x \le \frac{1}{3} \text{ or } x \ge 5\}$

Find the domain and range and asymptote for

$$y = \log(x + 7) - 8$$

D: $(-7, \infty)$ or $x > -7$

R: All real #'s

Asymptote: $x = -7$

Q

Domain: $x > -7$

Range: All real #s

Asymptote: $x = -7$

Solve $81x^4 - 100x^2 = 0$.

$x^2(81x^2 - 100) = 0$

$x^2(9x - 10)(9x + 10) = 0$

$x^2 = 0$ → $x = 0$

$9x - 10 = 0$ → $9x = 10$ → $x = 10/9$

$9x + 10 = 0$ → $9x = -10$ → $x = -10/9$

T

$$x = 0, \frac{10}{9}, -\frac{10}{9}$$

The half-life for Radium is 85 days. If you have 2500 mg of Radium, how much will remain after 2 years?

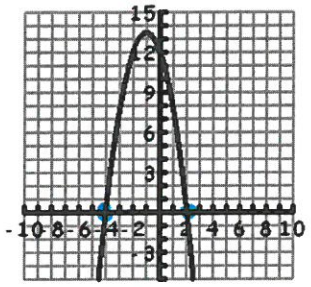
2 years = 730 days

$y = 2500\left(\frac{1}{2}\right)^{730/85}$

$= 6.5$ mg

S 6.5

Write equation of the quadratic shown in standard form. (Vertex is (-1, 13.5)



Points: (-4,0)
(2,0)
(-1,13.5)

$y = k(x+4)(x-2)$

$13.5 = k(-1+4)(-1-2)$

$13.5 = k(3)(-3)$

$13.5 = -9k$

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

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

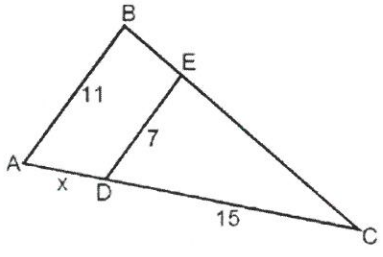
$y = -\frac{3}{2}(x^2+2x-8)$

$y = -\frac{3}{2}x^2 - 3x + 12$

R $y = -\frac{3}{2}x^2 - 3x + 12$

$\Delta CDE \sim \Delta CAB$

Solve for x.



$\frac{7}{11} \times \frac{15}{x+15}$

$7(x+15) = 15(11)$

$7x + 105 = 165$

$7x = 60$

$x = 60/7$

W

$$x = \frac{60}{7}$$

Given ΔJKL, reflect over y = -x and translate <3, -1>.

J(2, 1), K(-3, 4), L(-5, 6)

$(x,y) \rightarrow (-y,-x)$

① J(-1,-2), K(-4,3) L(-6,5)

② J(2,-3), K(-1,2) L(-3,4)