Student: _____ Instructor: Alfredo Alvarez Assignment: MA1314FIESTACOREQ1414READY039
Date: _____ Course: Math 1314 Alvarez

1. Solve the equation by factoring.

$14x^2 + 3x - 2 = 0$

The solution set is { }.
(Use a comma to separate answers as needed.)

Answer: $\frac{2}{7}, -\frac{1}{2}$

ID: 1.5.5

2. Solve for x using the quadratic formula.

$x^2 - 4x + 29 = 0$

The solution set is { }.
(Type an exact answer, using radicals as needed. Express complex numbers in terms of i. Use a comma to separate answers as needed.)

Answer: $2 + 5i, 2 - 5i$

ID: 1.5.73

3. Solve the given radical equation. Check all proposed solutions.

$\sqrt{3x + 31} = x + 7$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The solution set is { }.
(Use a comma to separate answers as needed.)

B. There is no solution.

Answer: A. The solution set is { −2 }. (Use a comma to separate answers as needed.)

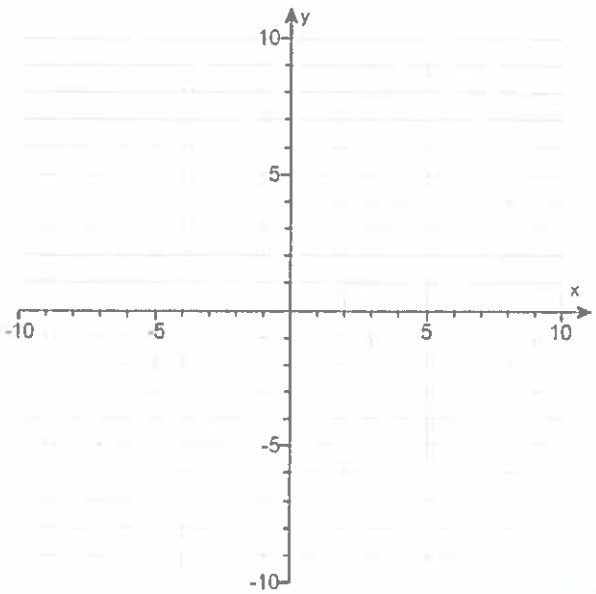
ID: 1.6.15

4.

Graph the given functions, f and g, in the same rectangular coordinate system. Then describe how the graph of g is related to the graph of f.

$f(x) = x$

$g(x) = x - 6$



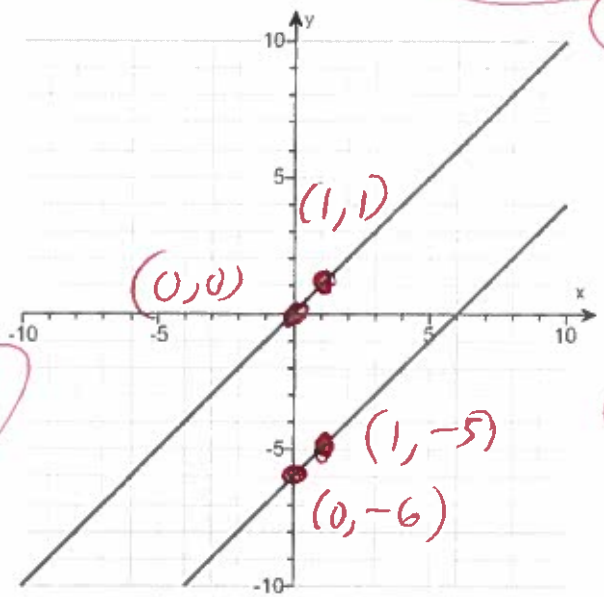
Use the graphing tool to graph the functions.

How is the graph of f shifted to get the graph of g?

The graph of g is the graph of f shifted (1) _____ by _____ units.

(1) ○ down
○ up

Answers



(1) down

6

ID: 2.1.39

$f(x) = x$

$f(0) = 0$

$f(1) = 1$

x	f(x)
0	0
1	1

$g(x) = x - 6$

$g(0) = (0) - 6$

$g(0) = 0 - 6$

$g(0) = -6$

$g(1) = (1) - 6$

$g(1) = 1 - 6$

$g(1) = -5$

x	g(x)
0	-6
1	-5

Answer

use graphing calculator

$x_{min} = -12$

$x_{max} = 12$

$y_{min} = -10$

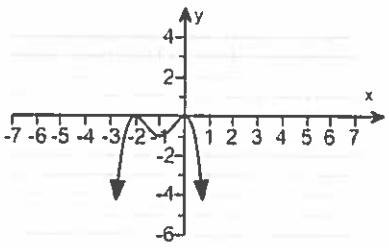
$y_{max} = 10$

5. Use the graph to determine

(a) open intervals on which the function is increasing, if any.

(b) open intervals on which the function is decreasing, if any.

(c) open intervals on which the function is constant, if any.



(a) Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

○ A. The function is increasing on the interval(s) _____.
(Type your answer in interval notation. Use a comma to separate answers as needed.)

○ B. The function is never increasing.

(b) Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

○ A. The function is decreasing on the interval(s) _____.
(Type your answer in interval notation. Use a comma to separate answers as needed.)

○ B. The function is never decreasing.

(c) Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

○ A. The function is constant on the interval(s) _____.
(Type your answer in interval notation. Use a comma to separate answers as needed.)

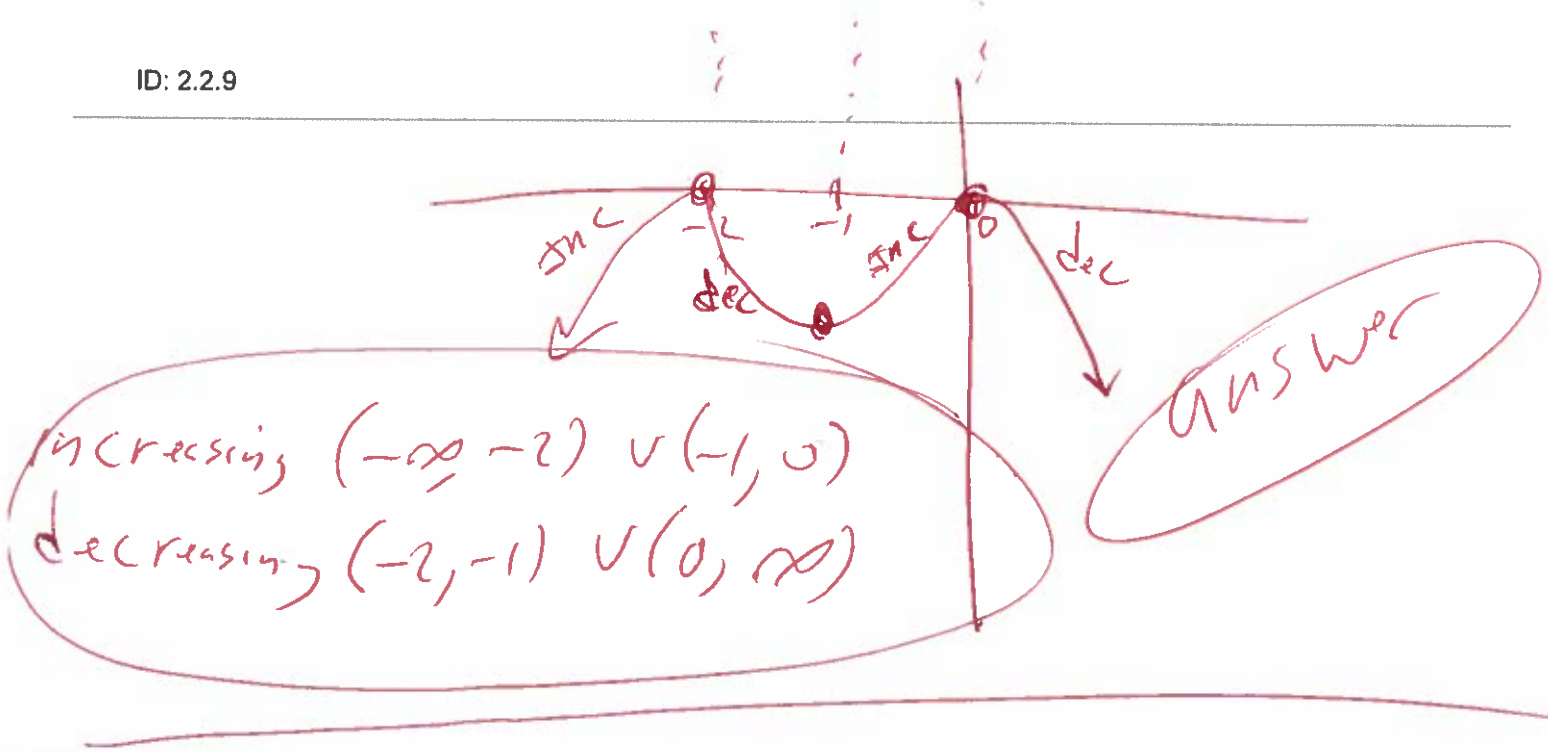
○ B. The function is never constant.

Answers A. The function is increasing on the interval(s) $(-\infty, -2), (-1, 0)$.
(Type your answer in interval notation. Use a comma to separate answers as needed.)

A. The function is decreasing on the interval(s) $(-2, -1), (0, \infty)$.
(Type your answer in interval notation. Use a comma to separate answers as needed.)

B. The function is never constant.

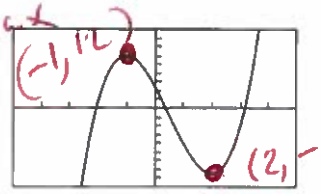
ID: 2.2.9



6.

The graph and equation of the function f are given.
a. Use the graph to find any values at which f has a relative maximum, and use the equation to calculate the relative maximum for each value.
b. Use the graph to find any values at which f has a relative minimum, and use the equation to calculate the relative minimum for each value.

$f(x) = 2x^3 - 3x^2 - 12x + 5$



[-5,5,1] by [-18,18,2]

a. Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

- ○ **A.** The function f has (a) relative maxima(maximum) at _____ and the relative maxima(maximum) are(is) _____.
  (Use a comma to separate answers as needed.)
- ○ **B.** The function f has no relative maxima.

b. Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

- ○ **A.** The function f has (a) relative minima(minimum) at _____ and the relative minima(minimum) are(is) _____.
  (Use a comma to separate answers as needed.)
- ○ **B.** The function f has no relative minima.

Answers A.

The function f has (a) relative maxima(maximum) at [-1] and the relative maxima(maximum) are(is) [12].
(Use a comma to separate answers as needed.)

A.

The function f has (a) relative minima(minimum) at [2] and the relative minima(minimum) are(is) [-15].
(Use a comma to separate answers as needed.)

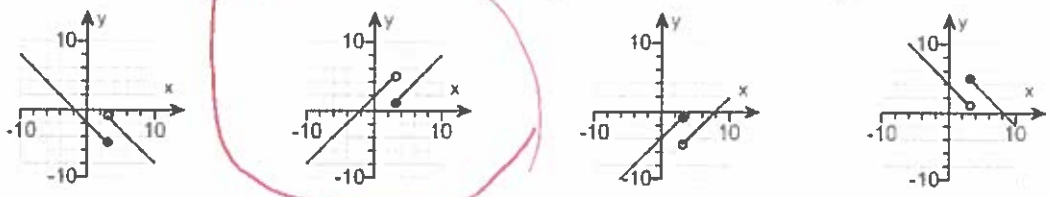
ID: 2.2.15

7. The domain of the piecewise function is $(-\infty,\infty)$.
   a. Graph the function.
   b. Use your graph to determine the function's range.

$$f(x)=\begin{cases} x+2 & \text{if } x<3 \\ x-2 & \text{if } x\geq 3 \end{cases}$$

a. Choose the correct graph below.

○ A. ◉ B. ○ C. ○ D.



Use Graphing Calculator and Math

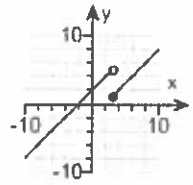
$Y_1 = X+2 \div (X<3)$ Open Circle

$Y_2 = X-2 \div (X\geq 3)$ Closed Circle

$Xmin = -12$
$Xmax = 12$
$Ymin = -10$
$Ymax = 10$

b. The range of f(x) is [ ]. (Type your answer in interval notation.)

Answers



B.

$(-\infty,\infty)$

Answer

ID: 2.2.47

8. Find the difference quotient of f; that is, find $\frac{f(x+h)-f(x)}{h}$, $h\neq 0$, for the following function. Be sure to simplify.

$f(x)=x^2-3x+7$

$\frac{f(x+h)-f(x)}{h}$ = [ ] (Simplify your answer.)

Answer: $2x+h-3$

ID: 2.2.61

$$\frac{((x+h)^2-3(x+h)+7)-(x^2-3x+7)}{h} =$$

$$\frac{(x+h)(x+h)-3x-3h+7-x^2+3x-7}{h} =$$

$$\frac{x^2+xh+xh+h^2-3x-3h+7-x^2+3x-7}{h} =$$

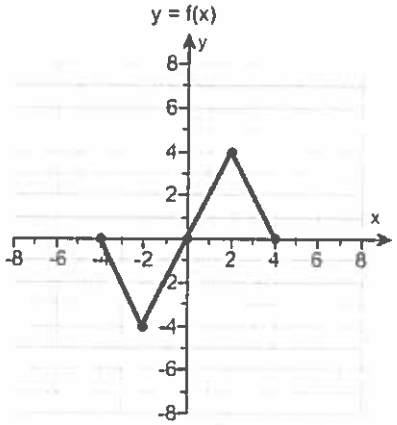
$$\frac{x^2+2xh+h^2-3x-3h+7-x^2+3x-7}{h} =$$

$$\frac{2xh+h^2-3h}{h} =$$

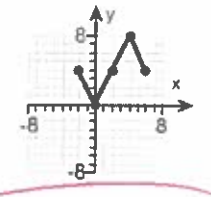
$$\frac{2xh}{h}+\frac{h^2}{h}-\frac{3}{h} =$$

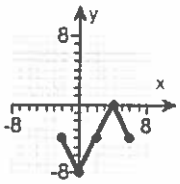
$2x-h-3$ Answer

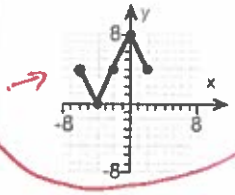
9. Use the graph of y = f(x) to graph the function g(x) = f(x + 2) + 4.

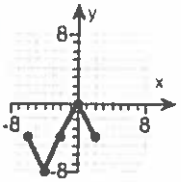


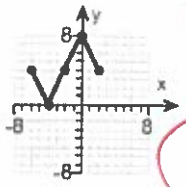
Choose the correct graph of g below.

A. 

B. 

C. 

D. 

Answer: 

C.

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

opposite

shift −2

Left

answer

shift up

4

ID: 2.5.21

10. Find the domain of the function.

$f(x) = \sqrt{25 - 5x}$

What is the domain of f?

[ ] (Type your answer in interval notation.)

Answer: $(-\infty, 5]$

ID: 2.6.23

$f(x) = \sqrt{25-5x}$

$25 - 5x \geq 0$

$25 - 5x - 25 \geq 0 - 25$

$-5x \geq -25$

$\frac{-5x}{-5} \leq \frac{-25}{-5}$

$x \leq 5$

$(-\infty, 5]$

answer

formula

domain

$f(x) = \sqrt{Ax+B}$

Set

$Ax + B \geq 0$

11. First find $f+g$, $f-g$, fg and $\frac{f}{g}$. Then determine the domain for each function.

$f(x) = 2x^2 + 16x + 14$ $g(x) = x + 7$

$(f+g)(x) =$ ☐ (Simplify your answer.)

$f(x)+g(x) =$

$(2x^2+16x+14) + (x+7) =$

$2x^2+16x+14+x+7 =$

$2x^2+16x+14+1x+7 =$

$2x^2 + 17x + 21 =$

What is the domain of $f+g$?

- ○ $[0,\infty)$
- ○ $\left(-\frac{21}{17},\infty\right)$
- ○ $(-\infty,\infty)$
- ○ $\left(-\infty,-\frac{21}{17}\right)\cup\left(-\frac{21}{17},\infty\right)$

domain $(-\infty, \infty)$ ✓

$(f-g)(x) =$ ☐ (Simplify your answer.)

$f(x) - g(x) =$

$(2x^2+16x+14) - (x+7) =$

$2x^2+16x+14 - x - 7 =$

$2x^2+16x+14 - 1x - 7 =$

$2x^2 + 15x + 7 =$

What is the domain of $f-g$?

- ○ $\left(-\frac{21}{17},\infty\right)$
- ○ $(-\infty,\infty)$
- ○ $[0,\infty)$
- ○ $\left(-\infty,-\frac{7}{8}\right)\cup\left(-\frac{7}{8},\infty\right)$

domain $(-\infty, \infty)$ ✓

$(fg)(x) =$ ☐

$f(x) \cdot g(x) =$

$(2x^2+16x+14)(x+7) =$

$2x^3+14x^2+16x^2+112x+14x+98 =$

$2x^3 + 30x^2 + 126x + 98$

What is the domain of fg?

- ○ $(-\infty,\infty)$
- ○ $(-\infty,-7)\cup(-7,\infty)$
- ○ $\left(-\frac{7}{15},\infty\right)$
- ○ $\left(-\infty,-\frac{7}{15}\right)\cup\left(-\frac{7}{15},\infty\right)$

domain $(-\infty, \infty)$ ✓

$\left(\frac{f}{g}\right)(x) =$ ☐ (Simplify your answer.)

$\frac{f(x)}{g(x)}$

$\frac{2x^2+16x+14}{x+7} =$

$\frac{2(x^2+8x+7)}{(x+7)} =$

$\frac{2(x+1)(x+7)}{(x+7)} =$

$2(x+1)$ or $2x+2$ ✓

What is the domain of $\frac{f}{g}$?

- ○ $(-7,\infty)$
- ○ $(-\infty,-7)\cup(-7,\infty)$
- ○ $[0,\infty)$
- ○ $(-\infty,\infty)$

domain $(-\infty,-7)\cup(-7,\infty)$ ✓

Answers $2x^2 + 17x + 21$

$(-\infty,\infty)$

$2x^2 + 15x + 7$

$(-\infty,\infty)$

$2x^3 + 30x^2 + 126x + 98$

$(-\infty,\infty)$

$2x + 2$

$(-\infty,-7)\cup(-7,\infty)$

ID: 2.6.35

12. For $f(x) = x + 4$ and $g(x) = 3x + 2$, find the following functions.

a. $(f \circ g)(x)$; b. $(g \circ f)(x)$; c. $(f \circ g)(0)$; d. $(g \circ f)(0)$

a. $(f \circ g)(x) =$ _____ (Simplify your answer.)

b. $(g \circ f)(x) =$ _____ (Simplify your answer.)

c. $(f \circ g)(0) =$ _____

d. $(g \circ f)(0) =$ _____

Answers $3x + 6$

$3x + 14$

6

14

$(fog)(x) =$
$f(g(x)) =$
$f(3x+2) =$
$(3x+2)+4 =$
$3x+2+4 =$
$3x+6 =$

$(fog)(x) = 3x+6$
$(fog)(0) = 3(0)+6$
$(fog)(0) = 0+6$
$(fog)(0) = 6$

$(gof)(x) =$
$g(f(x)) =$
$g(x+4) =$
$3(x+4)+2 =$
$3x+12+2 =$
$3x+14 =$

$(gof)(x) = 3x+14$
$(gof)(0) = 3(0)+14$
$(gof)(0) = 0+14$
$(gof)(0) = 14$

answer

ID: 2.6.53

13. Find the distance between the pair of points.

(1,4) and (10,16)

$x_1\ y_1\ \ x_2\ y_2$

The distance between the points is _____ units.
(Round to two decimal places as needed.)

Answer: 15

ID: 2.8.1

distance

$d = \sqrt{(x_1-x_2)^2+(y_1-y_2)^2}$

$d = \sqrt{((1)-(10))^2+((4)-(16))^2}$

$d = \sqrt{(1-10)^2+(4-16)^2}$

$d = \sqrt{(-9)^2+(-12)^2}$

$d = \sqrt{81+144}$

$d = \sqrt{225}$

$d = 15$

answer

14. Find the midpoint of the line segment with the given endpoints.

(4,8) and (10,6)

x_1, y_1 x_2, y_2

The midpoint of the segment is ____.
(Type an ordered pair.)

Answer: (7,7)

$\text{Midpoint} = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$\text{Midpoint} = \left(\frac{(4)+(10)}{2}, \frac{(8)+(6)}{2}\right)$

$\text{Midpoint} = \left(\frac{14}{2}, \frac{14}{2}\right)$

$\text{Midpoint} = (7,7)$ Answer

ID: 2.8.19

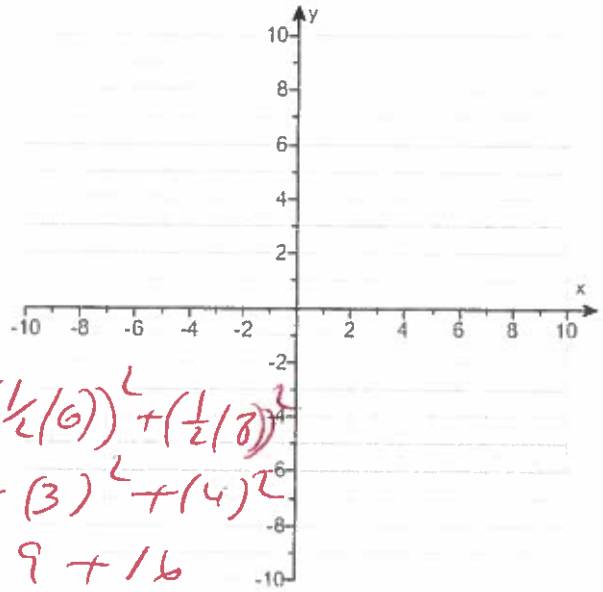
15. Complete the square and write the equation of the circle in standard form. Then determine the center and radius of the circle to graph the equation.

$x^2 + y^2 + 6x + 8y + 21 = 0$

$x^2 + 6x + y^2 + 8y = -21$

The equation in standard form is ____.
(Simplify your answer.)

Use the graphing tool to graph the circle.



$x^2 + 6x + \left(\frac{1}{2}(6)\right)^2 + y^2 + 8y + \left(\frac{1}{2}(8)\right)^2 = -21 + \left(\frac{1}{2}(6)\right)^2 + \left(\frac{1}{2}(8)\right)^2$

$x^2 + 6x + (3)^2 + y^2 + 8y + (4)^2 = -21 + (3)^2 + (4)^2$

$x^2 + 6x + 9 + y^2 + 8y + 16 = -21 + 9 + 16$

$x^2 + 6x + 9 + y^2 + 8y + 16 = 4$

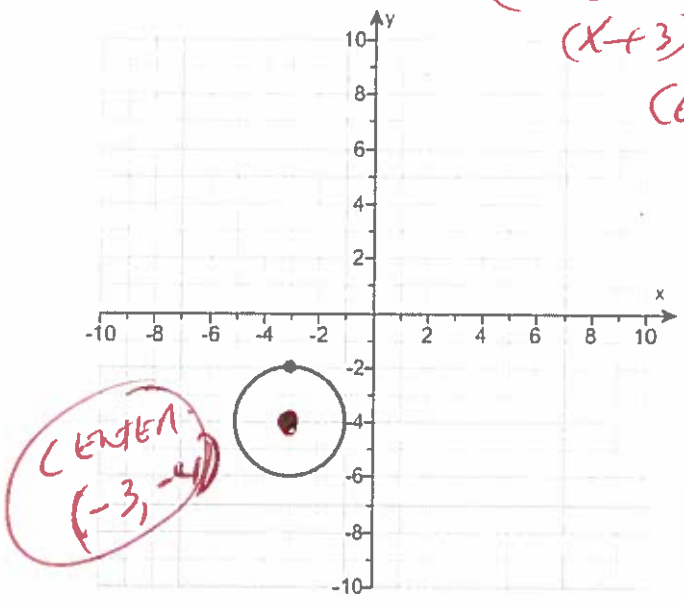
Answers $(x+3)^2 + (y+4)^2 = 4$

$(x+3)(x+3) + (y+4)(y+4) = 4$

$(x+3)^2 + (y+4)^2 = 4$

CENTER $= (-3, -4)$

Radius $= \sqrt{4} = 2$



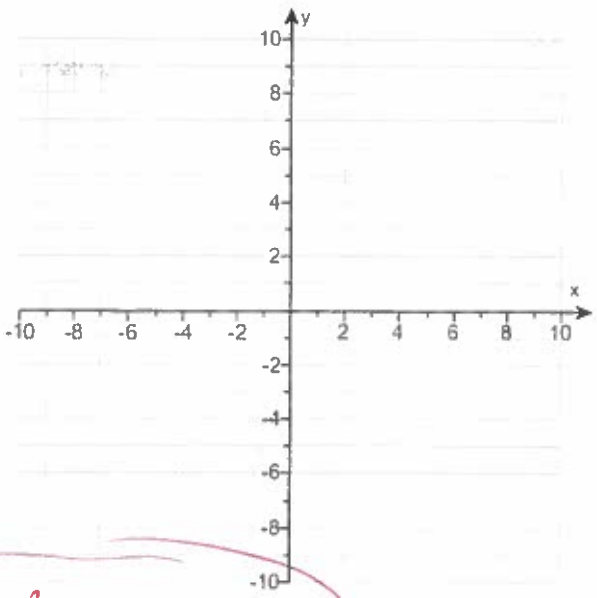
Answer

ID: 2.8.53

16.

Use the vertex and intercepts to sketch the graph of the quadratic function. Give the equation of the parabola's axis of symmetry. Use the graph to determine the function's domain and range.

$f(x) = x^2 + 4x - 5$



Use the graphing tool to graph the equation. Use the vertex and one of the intercepts when drawing the graph.

The axis of symmetry is [ ].
(Type an equation.)

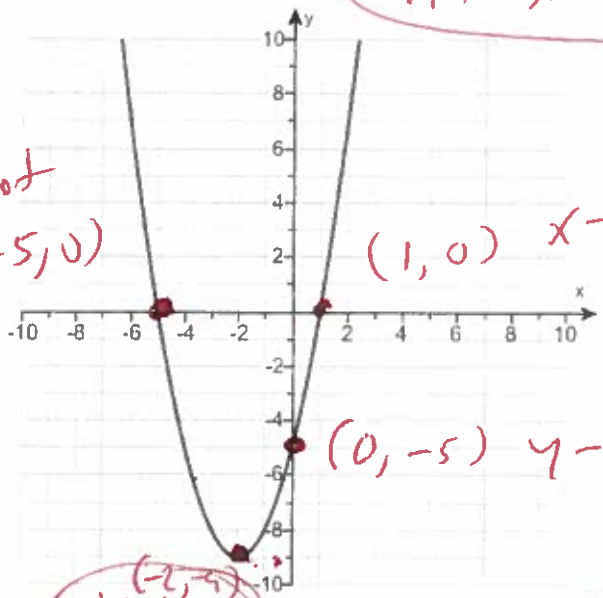
The domain of f is [ ].
(Type your answer in interval notation.)

The range of f is [ ].
(Type your answer in interval notation.)

$f(x) = x^2 + 4x - 5$

x	f(x)
-5	0
-2	-9
0	-5
1	0

Answers



x-intercept (-5, 0)

x-intercept (1, 0)

y-intercept (0, -5)

(-2, -9) VERTEX min

x = -2

(-∞, ∞)

[-9, ∞)

Use graphing Calculator

Xmin = -12
Xmax = 12
ymin = -10
ymax = 10

ID: 3.1.27

17. Consider the function $f(x) = -3x^2 + 30x - 1$.

a. Determine, without graphing, whether the function has a minimum value or a maximum value.
b. Find the minimum or maximum value and determine where it occurs.
c. Identify the function's domain and its range.

a. The function has a (1) _____ value.

b. The minimum/maximum value is _____. It occurs at x = _____.

c. The domain of f is _____. (Type your answer in interval notation.)

The range of f is _____. (Type your answer in interval notation.)

(1) ○ maximum
○ minimum

Answers (1) maximum

74

5

$(-\infty,\infty)$

$(-\infty,74]$

ID: 3.1.41

Graph opens down

18. The following function is given.

$f(x) = 7x^3 - 5x^2 - 63x + 45$

use Synthetic division

a. List all rational zeros that are possible according to the Rational Zero Theorem. Choose the correct answer below.

Last
First

$\frac{\pm 45}{7}$

Possible rational zeros

- A. $\pm 1, \pm 7, \pm\frac{1}{3}, \pm\frac{7}{3}, \pm\frac{1}{6}, \pm\frac{7}{6}, \pm\frac{1}{5}, \pm\frac{7}{5}, \pm\frac{1}{15}, \pm\frac{7}{15}, \pm\frac{1}{45}, \pm\frac{7}{45}$
- B. $\pm 1, \pm 7, \pm\frac{1}{3}, \pm\frac{7}{3}, \pm\frac{1}{9}, \pm\frac{7}{9}, \pm\frac{1}{5}, \pm\frac{7}{5}, \pm\frac{1}{15}, \pm\frac{7}{15}, \pm\frac{1}{45}, \pm\frac{7}{45}$
- C. $\pm 1, \pm 3, \pm 6, \pm 5, \pm 15, \pm 45, \pm\frac{1}{7}, \pm\frac{3}{7}, \pm\frac{6}{7}, \pm\frac{5}{7}, \pm\frac{15}{7}, \pm\frac{45}{7}$
- D. $\pm 1, \pm 3, \pm 9, \pm 5, \pm 15, \pm 45, \pm\frac{1}{7}, \pm\frac{3}{7}, \pm\frac{9}{7}, \pm\frac{5}{7}, \pm\frac{15}{7}, \pm\frac{45}{7}$

$\pm 45, \pm 15, \pm 5, \pm 3, \pm 9, \pm 1$
$\pm 1, \pm 7$

b. Use synthetic division to test several possible rational zeros in order to identify one actual zero.

One rational zero of the given function is _____.
(Simplify your answer.)

c. Use the zero from part **(b)** to find all the zeros of the polynomial function.

The zeros of the function $f(x) = 7x^3 - 5x^2 - 63x + 45$ are _____.
(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

Answers
D. $\pm 1, \pm 3, \pm 9, \pm 5, \pm 15, \pm 45, \pm\frac{1}{7}, \pm\frac{3}{7}, \pm\frac{9}{7}, \pm\frac{5}{7}, \pm\frac{15}{7}, \pm\frac{45}{7}$

$\frac{5}{7}$

$\frac{5}{7}, 3, -3$

use Synthetic division

3]	7	−5	−63	45
		21	48	−45
	7	16	−15	0 rem

Possible $\frac{7}{1}$

$7x^2 + 16x - 15 = 0$

$(7x - 5)(x + 3) = 0$

$7x - 5 = 0$ or $x + 3 = 0$

$7x - 5 + 5 = 0 + 5$ or $x + 3 - 3 = 0 - 3$

$7x = 5$ or $x = -3$

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

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

15.1
3.5

answer

$3, \frac{5}{7}, -3$

ID: 3.4.11

19. The following equation is given.

$x^3 - 2x^2 - 25x + 50 = 0$

a. List all rational roots that are possible according to the Rational Zero Theorem.

(Use a comma to separate answers as needed.)

b. Use synthetic division to test several possible rational roots in order to identify one actual root.

One rational root of the given equation is ____.
(Simplify your answer.)

c. Use the root from part (b.) and solve the equation.

The solution set of $x^3 - 2x^2 - 25x + 50 = 0$ is {____}.
(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

Answers 1, −1, 5, −5, 50, −50, 2, −2, 10, −10, 25, −25

2

2, 5, −5

ID: 3.4.17

20. Find the vertical asymptotes, if any, and the values of x corresponding to holes, if any, of the graph of the rational function.

$$h(x) = \frac{x+3}{x(x+6)}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice. (Type an equation. Use a comma to separate answers as needed.)

- ○ **A.** There are no vertical asymptotes but there is(are) hole(s) corresponding to ____.
- ○ **B.** The vertical asymptote(s) is(are) ____ and hole(s) corresponding to ____.
- ○ **C.** The vertical asymptote(s) is(are) ____. There are no holes.
- ○ **D.** There are no discontinuities.

Answer: C. The vertical asymptote(s) is(are) $x = -6, x = 0$. There are no holes.

ID: 3.5.23

21. Find the horizontal asymptote, if any, of the graph of the rational function.

$$f(x) = \frac{12x}{4x^2 + 3}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The horizontal asymptote is _____. (Type an equation.)
- B. There is no horizontal asymptote.

Answer: A. The horizontal asymptote is $y = 0$. (Type an equation.)

ID: 3.5.37

22. Find the horizontal asymptote, if any, of the graph of the rational function.

$$g(x) = \frac{20x^2}{5x^2 + 6}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The horizontal asymptote is _____. (Type an equation.)
- B. There is no horizontal asymptote.

Answer: A. The horizontal asymptote is $y = 4$. (Type an equation.)

ID: 3.5.39

23. **a.** Find the slant asymptote of the graph of the rational function and **b.** Use the slant asymptote to graph the rational function.

$$f(x) = \frac{x^2 - x - 12}{x - 7}$$

7 | 1 −1 −12
7 42
1 6 30
$y = x + 6$

find SLANT Asymptote
$y = x + 6$

a. Find the slant asymptote of the graph of f. Select the correct choice below and fill in any answer boxes within your choice.

y-intercept let $x = 0$

$y = f(x) = \frac{x^2 - x - 12}{x - 7}$

$\frac{(0)^2 - (0) - 12}{(0) - 7} = \frac{0 - 0 - 12}{-7} = \frac{-12}{-7}$

$y = \frac{12}{7}$

y-intercept = $(0, \frac{12}{7})$

- A. y = _____
- B. There is no slant asymptote.

b. Use the slant asymptote to graph the rational function.

First determine the symmetry of the graph of f.

- A. The graph has y-axis symmetry: $f(-x) = f(x)$.
- B. The graph has origin symmetry: $f(-x) = -f(x)$.
- C. The graph has both y-axis and origin symmetry.
- D. The graph has neither y-axis nor origin symmetry.

find x-intercept let $y = 0$

$\frac{0}{1} = \frac{x^2 - x - 12}{x - 7}$

Find the y-intercept(s). Select the correct choice below and fill in any answer boxes within your choice.

$0(x-7) = 1(x^2 - x - 12)$

- A. The y-intercept is _____.
  (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- B. There is no y-intercept.

$0 = x^2 - x - 12$

Find the x-intercept(s). Select the correct choice below and fill in any answer boxes within your choice.

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

- A. The x-intercept is _____.
  (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- B. There is no x-intercept.

$x+3=0$ OR $x-4=0$

Find the vertical asymptote(s). Select the correct choice below and fill in any answer boxes within your choice.

x Intercepts $(-3, 0)$ $(4, 0)$

$x+3-3=0-3$ OR $x-4+4=0+4$

$x = -3$ OR $x = 4$

- A. x = _____
  (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- B. There is no vertical asymptote.

Vertical Asymptote

Find the horizontal asymptote(s). Select the correct choice below and fill in any answer boxes within your choice.

set $x - 7 = 0$ Vertical asymptote

$x - 7 + 7 = 0 + 7$

$x = 7$

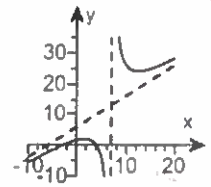
- A. y = _____
  (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- B. There is no horizontal asymptote.

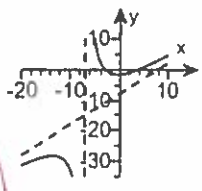
Plot points between and beyond each x-intercept and vertical asymptote, then use the information above to graph the rational function. Choose the correct graph below.

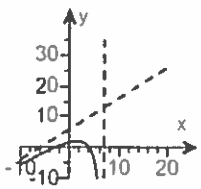
Use graphing Calculator

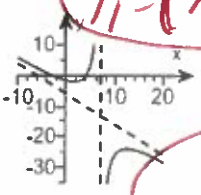
$Y_1 = (x^2 - x - 12) \div (x - 7)$

$x\text{min} = -10$ $y\text{min} = -10$
$x\text{max} = 10$ $y\text{max} = 10$

- A.


- B.


- C.


- D.


Answers A. y = x + 6

D. The graph has neither y-axis nor origin symmetry.

A. The y-intercept is $\frac{12}{7}$.

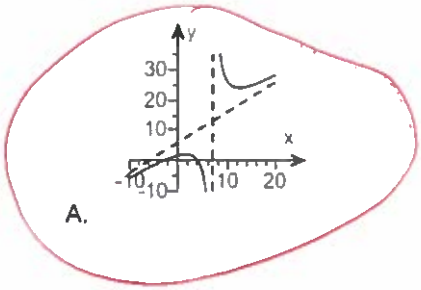
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

A. The x-intercept is −3,4.

(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

A. x = 7 (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

B. There is no horizontal asymptote.



A.

ID: 3.5.85

24. Graph the given function by making a table of coordinates.

$f(x) = 2^x$

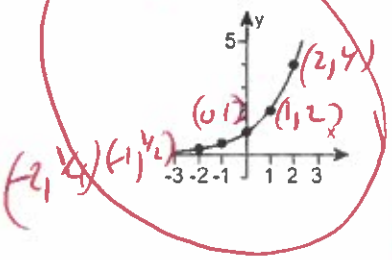
Complete the table of coordinates.

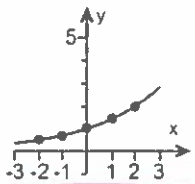
x	−2	−1	0	1	2
y					

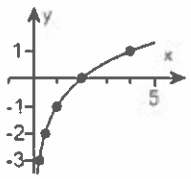
(Type integers or fractions. Simplify your answers.)

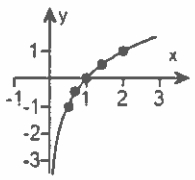
Choose the correct graph below.

○ A. ○ B. ○ C. ○ D.









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

$f(x) = 2^x$

$f(-2) = 2^{-2} = \frac{1}{2^2} = \frac{1}{2 \cdot 2} = \frac{1}{4}$

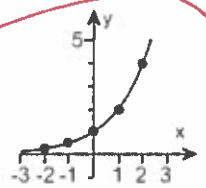
$f(-1) = 2^{-1} = \frac{1}{2^1} = \frac{1}{2}$

$f(0) = 2^0 = 1$

$f(1) = 2^1 = 2$

$f(2) = 2^2 = 2 \cdot 2 = 4$

x	f(x)
−2	1/4
−1	1/2
0	1
1	2
2	4



A.

ID: 4.1.11

25. Find the domain of the logarithmic function.

$f(x) = \log(4 - x)$

The domain of $f(x) = \log(4 - x)$ is _____.

(Type your answer in interval notation.)

Answer: $(-\infty, 4)$

ID: 4.2.77

Domain formula

$f(x) = \log(Ax + B)$

such that $Ax + B > 0$

Only

such that $4 - x > 0$

$4 - x - 4 > 0 - 4$

$-x > -4$

$\frac{-x}{-1} < \frac{-4}{-1}$

Divide by a negative, turn alligator around

$x < 4$

$x < 4$

$(-\infty, 4)$

26. Use properties of logarithms to expand the logarithmic expression as much as possible. Evaluate logarithmic expressions without using a calculator if possible.

$\log_b\left(\frac{x^3y}{z^6}\right) = \log_b(x^3y) - \log_b(z^6) =$

$\log_b\left(\frac{x^3y}{z^6}\right) =$ $\log_b(x^3) + \log_b(y) - \log_b(z^6) =$

$3\log_b(x) + \log_b(y) - 6\log_b(z) =$

Answer: $3\log_b x + \log_b y - 6\log_b z$

formula

$\log_b\left(\frac{A}{B}\right) = \log_b(A) - \log_b(B)$

$\log_b(AB) = \log_b(A) + \log_b(B)$

$\log_b(A^N) = N\log_b(A)$

Answer

ID: 4.3.27

27. Solve the following exponential equation by expressing each side as a power of the same base and then equating exponents.

$4^{x+3} = 16^{x-6}$

$(2^2)^{x+3} = (2^4)^{x-6}$

$2^{2x+6} = 2^{4x-24}$

$2x+6 = 4x-24$

$2x+6-6 = 4x-24-6$

$2x = 4x-30$

$2x-4x = 4x-30-4x$

$-2x = -30$

$\frac{-2x}{-2} = \frac{-30}{-2}$

$x = 15$ Answer

The solution set is { }.

Answer: 15

ID: 4.4.19

28. Solve the following exponential equation by taking the natural logarithm on both sides. Express the solution in terms of natural logarithms. Then, use a calculator to obtain a decimal approximation for the solution.

$8e^{7x} = 1656$

$\frac{8e^{7x}}{8} = \frac{1656}{8}$

$e^{7x} = 207$

$\ln(e^{7x}) = \ln(207)$

$7x\ln(e) = \ln(207)$

$7x(1) = \ln(207)$

$7x = \ln(207)$

$\frac{7x}{7} = \frac{\ln(207)}{7}$

$x = \frac{\ln(207)}{7}$ OR $x = 0.761816970\ldots$ OR $x = 0.76$

formula

$\ln(A^N) = N\ln(A)$

$\ln(e) = 1$

Answer

Round

What is the solution in terms of natural logarithms?

The solution set is { }.

(Use a comma to separate answers as needed. Simplify your answer. Use integers or fractions for any numbers in the expression.)

What is the decimal approximation for the solution?

The solution set is { }.

(Use a comma to separate answers as needed. Round to two decimal places as needed.)

Answers $\frac{\ln 207}{7}$

0.76

ID: 4.4.31

29. Solve the following logarithmic equation. Be sure to reject any value of x that is not in the domain of the original logarithmic expression. Give the exact answer.

$\log_2(x+13)=4$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The solution set is { }. (Type an integer or a simplified fraction.)

B. There is no solution.

Answer: A. The solution set is { 3 }. (Type an integer or a simplified fraction.)

ID: 4.4.55

30. Solve the logarithmic equation. Be sure to reject any value of x that is not in the domain of the original logarithmic expressions. Give an exact answer.

$\log_{11}x+\log_{11}(10x-1)=1$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The solution set is { }. (Type an exact answer in simplified form.)

B. There is no solution.

Answer: A. The solution set is { $\frac{11}{10}$ }. (Type an exact answer in simplified form.)

ID: 4.4.67

31. Solve the logarithmic equation. Be sure to reject any value of x that is not in the domain of the original logarithmic expressions. Give the exact answer.

$\log_4(x+9)-\log_4(x-6)=2$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The solution set is { }. (Simplify your answer. Use a comma to separate answers as needed.)

B. There is no solution.

Answer: A. The solution set is { 7 }. (Simplify your answer. Use a comma to separate answers as needed.)

ID: 4.4.71

32. Solve the logarithmic equation. Be sure to reject any value of x that is not in the domain of the original logarithmic expressions. Give the exact answer.

$\log(x+8) = \log x + \log 8$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The solution set is { }.
(Simplify your answer. Use a comma to separate answers as needed.)

B. There is no solution.

Answer: A. The solution set is $\left\{\frac{8}{7}\right\}$.
(Simplify your answer. Use a comma to separate answers as needed.)

ID: 4.4.77

33. Solve the logarithmic equation. Be sure to reject any value of x that is not in the domain of the original logarithmic expressions. Give the exact answer.

$\log x + \log(x-2) = \log 48$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The solution set is { }.
(Simplify your answer. Use a comma to separate answers as needed.)

B. There is no solution.

Answer: A. The solution set is {8}.
(Simplify your answer. Use a comma to separate answers as needed.)

ID: 4.4.87

34. Complete the table for a savings account subject to 2 compoundings yearly.

$\left[A = P\left(1 + \frac{r}{n}\right)^{nt}\right]$

Amounted Invested	Number of Compounding Periods	Annual Interest Rate	Accumulated Amount	Time t in Years
$10,000	2	5.75%	$18,000	?

Let A represent the accumulated amount, P the amount invested, n the number of compounding periods, r the annual interest rate, and t the time. Find the time, t.

t = _____ years

(Do not round until the final answer. Then round to one decimal place as needed.)

Answer: 10.4

ID: 4.4.107

35. Complete the table for a savings account subject to continuous compounding.

$(A = Pe^{rt})$

Amount Invested	Annual Interest Rate	Accumulated Amount	Time t in years
$8000	3%	$16,000	?

Let A represent the accumulated amount, P the amount invested, r the annual interest rate, and t the time. Find the time, t.

t ≈ _____ years

(Round to one decimal place as needed.)

Answer: 23.1

ID: 4.4.111

Use graphing calculator 2nd, matrix, edit, [A], 3x4

36. Solve the given system of equations.

$$\begin{aligned} x + y + 8z &= 6 \\ x + y + 6z &= 4 \\ x - 2y + 3z &= -2 \end{aligned}$$

$[A] = \begin{bmatrix} 1 & 1 & 8 & 6 \\ 1 & 1 & 6 & 4 \\ x & -2 & 3 & -2 \end{bmatrix}$

Select the correct choice below and fill in any answer boxes within your choice.

2nd matrix, math, rref, [A]

$rref[A] = \begin{bmatrix} 1 & 0 & 0 & -3 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 \end{bmatrix}$ $\begin{matrix} x \\ y \\ z \end{matrix}$

- ○ **A.** There is one solution. The solution set is {(, ,)}. (Simplify your answers.)
- ○ **B.** There are infinitely many solutions.
- ○ **C.** There is no solution.

Answer: A.

There is one solution. The solution set is {(−3 , 1 , 1)}. (Simplify your answers.)

$(x, y, z) = (-3, 1, 1)$

ID: 5.2.5

37. Write the first four terms of the sequence whose general term is given.

$$a_n = \frac{2n}{n+6}$$

Use a graphing calculator

$a_1 =$ _____ (Simplify your answer.)

$a_2 =$ _____ (Simplify your answer.)

$a_3 =$ _____ (Simplify your answer.)

$a_4 =$ _____ (Simplify your answer.)

$a_1 = \frac{2(1)}{1+6} = \frac{2}{7}$

$a_2 = \frac{2(2)}{2+6} = \frac{4}{8} = \frac{\cancel{4}(1)}{\cancel{4}(2)} = \frac{1}{2}$

$a_3 = \frac{2(3)}{3+6} = \frac{6}{9} = \frac{\cancel{3}(2)}{\cancel{3}(3)} = \frac{2}{3}$

$a_4 = \frac{2(4)}{4+6} = \frac{8}{10} = \frac{\cancel{2}(4)}{\cancel{2}(5)} = \frac{4}{5}$

Answers $\frac{2}{7}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{4}{5}$

ID: 8.1.9

38. Find the indicated sum. $\sum_{i=1}^{5} i(i+2)$ = use a graphing Calculator

$= 1(1+2)+2(2+2)+3(3+2)+4(4+2)+5(5+2) =$

$\sum_{i=1}^{5} i(i+2) =$ [ ] (Simplify your answer.)

$= 1(3)+2(4)+3(5)+4(6)+5(7) =$

Answer: 85 $= 3+8+15+24+35 =$

ID: 8.1.33 $= 85 =$

39. Write the first three terms of the binomial expansion, expressing the result in simplified form.

$(x+3)^9$

The first three terms of the binomial expansion are [ ]. (Simplify your answer.)

Use graphing Calculator

Answer: $x^9 + 27x^8 + 324x^7$

$(x+3)^9 =$

ID: 8.5.31

$C(x)(3) + C(x)(3) + C(x)(3) =$

$(1)(x^9)(1) + (9)(x^8)(3) + (36)(x^7)(9) =$

$x^9 + 27x^8 + 324x^7 =$

9 MATH PRB nCr 0 = 1

9 MATH PRB nCr 1 = 9

9 MATH PRB nCr 2 = 36