1. Simplify $\frac{6\sqrt{6}}{\sqrt{12}}$.

$\frac{6}{\sqrt{2}} = \frac{6\sqrt{2}}{2}$ $3\sqrt{2}$

$\frac{6}{\sqrt{2}}$ $\sqrt{2}$ $\sqrt{2}$ $\sqrt{4}$

A $\sqrt{2}$

B $2\sqrt{2}$

C $3\sqrt{2}$

D $6\sqrt{2}$

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2. Simplify $6\sqrt{20} - 4\sqrt{45}$.

F 0

G $2\sqrt{5}$

H $7\sqrt{5}$

J $10\sqrt{5}$

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3. Evaluate $\left(\frac{1}{2^{-3}}\right)^{-2}$.

A -64

B $-\frac{1}{64}$

C $\frac{1}{64}$

D 64

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4. Simplify $\left(\frac{x^{-2}y^{1}}{2(x^{2}y^{2})}\right)^{-3}$. Assume all variables are nonzero.

F $\frac{1}{8x^{12}y^{3}}$

G $\frac{1}{8x^{18}y^{9}}$

H $8x^{12}y^{3}$

J $8x^{18}y^{9}$

$\frac{x^{6}y^{-3}}{2^{-3}x^{-6}y^{-6}}$ $\frac{2^{3}x^{6}x^{6}y^{6}}{y^{3}}$ $\frac{8x^{12}y^{6}y^{3}}{y^{3}y^{3}}$ $8x^{12}y^{3}$

Dec 11-9:38 AM

5. Evaluate the expression $\frac{1.5 \times 10^{-1}}{7.5 \times 10^{-6}}$ and write the answer using scientific notation.

.2 X 10^5

A 2.0×10^{-6}

B 2.0×10^{-4}

C 2.0×10^{4}

D 2.0×10^{6}

2 X 10^4

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6. Evaluate $f(0.5)$ for $f(x) = \frac{1 - x^2}{x - 1}$.

F -1.5

G -0.5

H 0.5

J 1.5

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7. If 8 pencils can be purchased for 2 dollars, which function represents the cost, in cents, of d dozen pencils?

A $C(d) = \frac{25d}{12}$

B $C(d) = 25d$

C $C(d) = 150d$

D $C(d) = 300d$

$\frac{8}{\$2}$ $\frac{8}{200} = \frac{12}{x}$

$8x = 2400$

$x = 300$

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8. Solve $6x + 2(x - 3) = 5x - (6 - 2x)$.

F $x = 0$

G $x = 3$

H all real numbers

J no solution

$6x + 2x - 6 = 5x - 6 + 2x$

$8x - 6 = 7x - 6$

$-7x \quad +6 \quad -7x \quad +6$

$x = 0$

Dec 11-9:39 AM

9. Solve $\frac{8}{4x+1} = \frac{4}{3x-1}$.

A $x = 1.25$

B $x = 1.5$

C $x = 2.5$

D $x = 3$

Dec 11-9:39 AM

10. Which set of points could represent a linear function?

F {(5, 6), (1.5, 4), (–1, 2), (–4.5, 0)}

G {(1, 5), (3, 9), (5, 13), (7, 19)}

H {(–1, 3), (1, 7), (3, 11), (6, 17)}

J {(2, 1.1), (2, 1.2), (2, 1.3), (2, 1.4)}

2 2 2
4 4 6

2 2 3
4 4 6

-3.5 -2.5 -3.5
-2 -2 -2

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11. What is $1 = y - 2 + \frac{3}{2}x$ in slope-intercept form?

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

A $\frac{y}{3} = \frac{x}{2} + 1$

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

B $y = -\frac{3}{2}x + 1$

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

Dec 11-9:40 AM

12. Which is the equation of the line perpendicular to $x + 2y = 4$ and passing through (2, 2)?

$\frac{2y}{2} = \frac{-x}{2} + \frac{4}{2}$ $-1 \quad -3$

F $x + 2y = 6$ $2 + 4$

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

G $y = 2x - 2$ $2 = 4 - 2$

J $y = \frac{1}{2}x + 3$

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

Dec 11-9:40 AM

13. $\frac{|3-x|}{|3-x|} \frac{2}{} \geq 4$.

$\frac{2}{4} \geq \frac{4|3-x|}{4}$

$\frac{1}{2} \geq |3-x|$

A $\left\{x \middle| -\frac{7}{2} \leq x \leq -\frac{5}{2}\right\}$

B $\left\{x \middle| \frac{5}{2} \leq x \leq \frac{7}{2}\right\}$ ✓

C $\left\{x \middle| x \leq -\frac{7}{2} \text{ or } x \geq -\frac{5}{2}\right\}$

$-\frac{1}{2} \leq 3-x$

$x \leq 3\frac{1}{2}$

$\frac{1}{2} \geq 3-x$

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

D $\left\{x \middle| x \leq \frac{5}{2} \text{ or } x \geq \frac{7}{2}\right\}$

Dec 11-9:40 AM

14. If $g(x)$ is a horizontal stretch by a factor of 3 of $f(x) = 4|x| + 3$, what is the rule for $g(x)$?

F $g(x) = \frac{4}{3}|x| + 3$

G $g(x) = \frac{4}{3}|x| + 9$

H $g(x) = 12|x| + 3$

J $g(x) = 12|x| + 9$

$4|x| + 3$

$4\left(\frac{1}{3}\right)|x| + 3$

Dec 11-9:41 AM

16. Solve $\begin{cases} 4x - 3y = 9 \\ 8x - 6y = 2 \end{cases}$.

F $\left(-\frac{5}{4}, -\frac{4}{3}\right)$

H $\left(\frac{5}{4}, \frac{4}{3}\right)$

G $\left(\frac{5}{4}, -\frac{4}{3}\right)$

J no solution

Dec 11-9:41 AM

17. Apples cost $0.60 each and pears cost $0.75 each. Jenna buys 120 apples and pears for a class picnic and pays a total of $78.75. How many pears did she buy?

A 45

C 65

B 55

D 75

Dec 11-9:41 AM

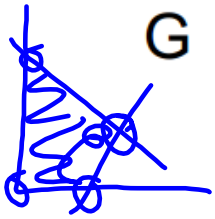
18. On a feasible region whose vertices are {(2, 12), (4, 7.5), (8, 4), (12, 1.5)}, what is the minimum of the objective function $R = 3x + 4y$, and where does it occur?

F 39 at (12, 15)

H 40 at (2, 12)

G 40 at (8, 4)

J 42 at (4, 7.5)



Dec 11-9:42 AM

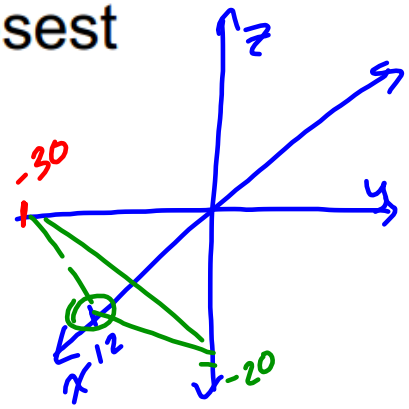
19. Which point on the plane $5x - 2y - 3z = 60$ is closest to the origin?

A x-intercept

B y-intercept

C z-intercept

D The origin is on the plane.



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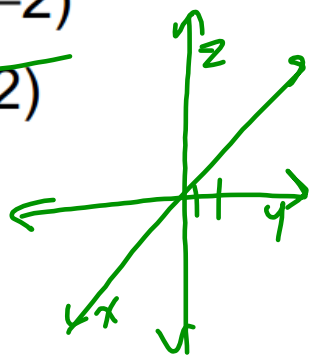
20. Which ordered triple represents the point that is 4 units down from the origin, 2 units right from the origin, and 6 units forward along the *x*-axis from the origin?

F (6, –2, –4) H (6, –4, –2)

G (6, 2, –4) J (6, –4, 2)

(6, 2, –4)



Dec 11-9:42 AM

22. If $C = \begin{bmatrix} -1 & -5 \\ 4 & 3 \\ -3 & 2 \end{bmatrix}$ and $D = \begin{bmatrix} 5 & -2 \\ -1 & 4 \\ 1 & -3 \end{bmatrix}$,

evaluate $C - 2D$.

F $\begin{bmatrix} -11 & -1 \\ 6 & -5 \\ -5 & 8 \end{bmatrix}$ H $\begin{bmatrix} -6 & -7 \\ 5 & -1 \\ -4 & 5 \end{bmatrix}$

G $\begin{bmatrix} -7 & -12 \\ 9 & 2 \\ -7 & 7 \end{bmatrix}$ J $\begin{bmatrix} 9 & -1 \\ 2 & 11 \\ -1 & -4 \end{bmatrix}$

Dec 11-9:43 AM

23. If $P = \begin{bmatrix} 3 & 2 \\ 1 & 1 \\ -2 & 0 \end{bmatrix}$ and $Q = \begin{bmatrix} 2 & -1 & 4 \\ -1 & 3 & 0 \end{bmatrix}$,

$3(2)+2(-1)$
$6-2$

evaluate PQ.

A $\begin{bmatrix} -3 & 3 \\ 0 & 1 \end{bmatrix}$

C $\begin{bmatrix} 1 & 7 & 8 \\ 1 & 2 & 4 \\ 2 & -6 & 0 \end{bmatrix}$

B $\begin{bmatrix} 6 & 8 \\ 2 & 0 \end{bmatrix}$

D $\begin{bmatrix} 4 & 3 & 12 \\ 1 & 2 & 4 \\ -4 & 2 & -8 \end{bmatrix}$

Dec 11-9:44 AM

24. If $A = \begin{bmatrix} -2 & 1 \\ -1 & 2 \end{bmatrix}$, evaluate A^2.

F $\begin{bmatrix} 4 & 1 \\ 1 & 4 \end{bmatrix}$

H $\begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$

G $\begin{bmatrix} 3 & 1 \\ 1 & 3 \end{bmatrix}$

J $\begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}$

Dec 11-9:44 AM

26. Find the determinant of $\begin{bmatrix} a & b \\ \frac{1}{a} & \frac{1}{b} \end{bmatrix}$.

$\frac{b}{a}$

$\frac{a}{b}$

$\frac{a}{b} - \frac{b}{a}$

F 0

H $\begin{bmatrix} \frac{a-b}{ab} \end{bmatrix}$

G $\begin{bmatrix} \frac{1}{ab} \end{bmatrix}$

J $\begin{bmatrix} \frac{a^2-b^2}{ab} \end{bmatrix}$

Dec 11-9:45 AM

27. Which matrix is the inverse of $\begin{bmatrix} 2 & -1 \\ -1 & 0.5 \end{bmatrix}$?

A $\begin{bmatrix} 0.5 & -1 \\ -1 & 2 \end{bmatrix}$

B $\frac{1}{2}\begin{bmatrix} 0.5 & -1 \\ -1 & 2 \end{bmatrix}$

C $\begin{bmatrix} -0.5 & 1 \\ 1 & -2 \end{bmatrix}$

D There is no inverse.

$[A]^{-1}$

Dec 11-9:45 AM

28. Which matrix is NOT equivalent to $\begin{bmatrix} 3 & -1 & 17 \\ 2 & 3 & 17 \end{bmatrix}$?

$3x - y = 17$

$2x + 3y = 17$

$[A]^{-1}[B]$

F $\left[\begin{array}{cc|c} -1 & 3 & 17 \\ 3 & 2 & 4 \end{array}\right]$

H $\left[\begin{array}{cc|c} 4 & 6 & 34 \\ 3 & -1 & 17 \end{array}\right]$

G $\left[\begin{array}{cc|c} 3 & -1 & 17 \\ 0 & -11 & -17 \end{array}\right]$

J $\left[\begin{array}{cc|c} 5 & 2 & 34 \\ 1 & -4 & 0 \end{array}\right]$

Dec 11-9:45 AM

29. The Outdoors Club is selling three different sizes of chocolate bars to raise money. The chart below shows the number of each size sold by three different students and the total number of dollars brought in. How much would it cost to buy one of each size?

	S	M	L	Total Value
Alexa	4	7	6	$47.50
Bennett	6	8	3	$41
Candice	8	12	2	$50

$[A]^{-1}[B] = \begin{bmatrix} \\ \\ \end{bmatrix}$

A $7.00

B $7.50

C $8.00

D $8.50

Dec 11-9:46 AM

30. If the parent function $f(x) = x^2$ is horizontally stretched by a factor of 2, translated 3 units to the left, then translated 1 unit up, write the resulting function $g(x)$ in vertex form.

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

G $g(x) = \frac{1}{2}(x+3)^2 + 1$

H $g(x) = 2(x-3)^2 + 1$

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

Dec 11-9:46 AM

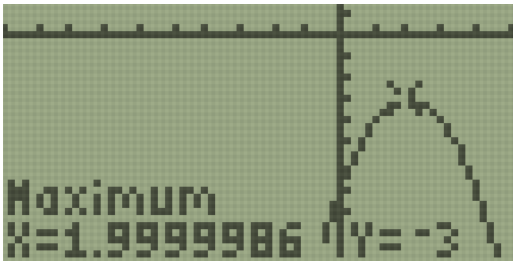
31. Find the minimum or maximum of $g(x) = -x^2 + 4x - 7$.

A maximum of –11

B minimum of –11

C maximum of –3

D minimum of –3



Dec 11-9:46 AM

32. Write a quadratic function in standard form having zeros of –4 and 0.5.

F ~~$f(x) = x^2 - 7x + 4$~~

G ~~$g(x) = x^2 + 7x + 4$~~

H $h(x) = 2x^2 - 7x - 4$

J $j(x) = 2x^2 + 7x - 4$

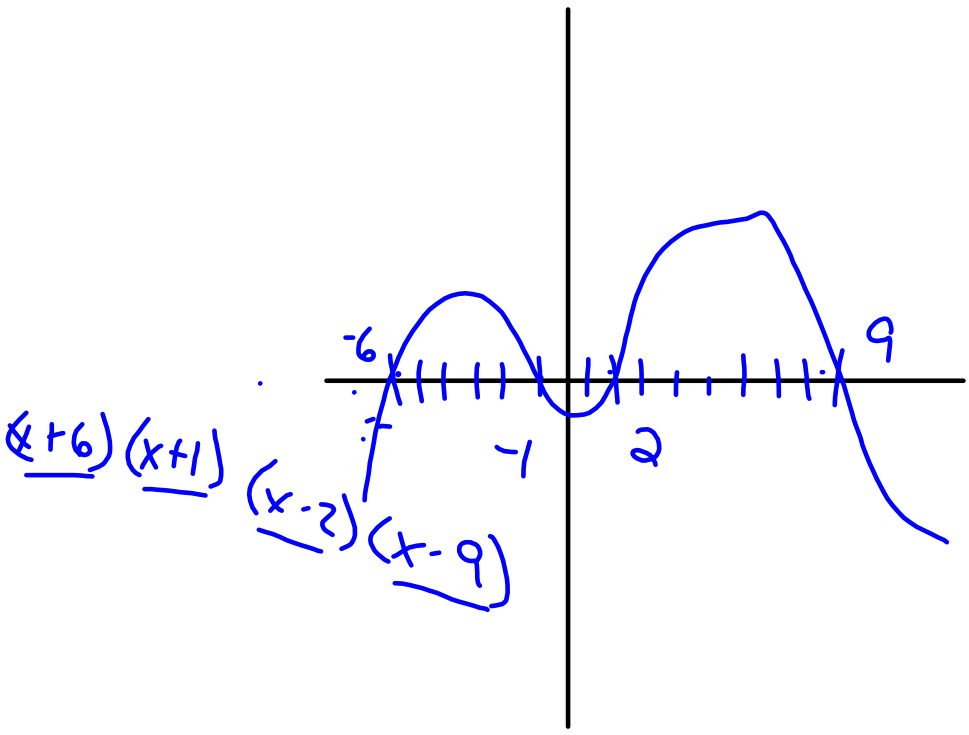
$(x+4)(x-.5)$

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

$(x+4)(2x-1)$

$2x^2 - x + 8y - 4$

Dec 11-9:47 AM



$(x+6)(x+1)$

$(x-2)(x-9)$

Dec 15-9:59 AM

33. Write $c(x) = x^2 + 6x - 11$ in vertex form.

A $c(x) = (x-3)^2 - 20$

B $c(x) = (x+3)^2 - 20$

C $c(x) = (x-6)^2 - 11$

D $c(x) = (x-6)^2 - 11$

$\frac{-6}{2(1)}$

-3

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

$(x+3)^2$

Dec 11-9:47 AM

34. Use the Quadratic Formula to solve $x^2 + x = -1$.

$a = 1$

$b = 1$

$c = 1$

F $-\frac{1}{2} \pm \frac{\sqrt{3}}{2}i$

H $\frac{1}{2} \pm \frac{\sqrt{3}}{2}i$

G $-\frac{1}{2} \pm \frac{\sqrt{5}}{2}i$

J $\frac{1}{2} \pm \frac{\sqrt{5}}{2}i$

Dec 11-9:47 AM

35. Write a quadratic equation that fits the points (2, 27), (4, 61), and (7, 142).

A $x^2 + 10x + 3$ C $2x^2 + 4x + 13$

B $x^2 + 11x + 1$ D $2x^2 + 5x + 9$

Quad Reg

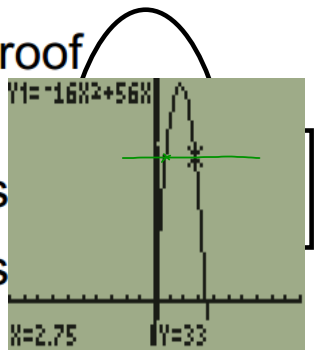
x	y
2	27
4	61
7	142

Dec 11-9:47 AM

36. Carmen is standing on the ground. She tries to throw a tennis ball over her house, but it hits the roof on the way down at a height of 33 feet. The quadratic equation that models the path of the ball is $b(t) = -16t^2 + 56t$. How long did it take for the ball to hit the roof after it left Carmen's hand?

F 0.75 seconds H 2.25 seconds

G 1.5 seconds J 2.75 seconds



$33 = -16t^2 + 56t$ $-16t^2 + 56t - 33$

Dec 11-9:48 AM

37. Simplify $\frac{(2+4i)}{(1-i)} \cdot \frac{(1+i)}{(1+i)}$

$2+2i+4i+4i^2$

1^2-i^2 $1+1$ 2

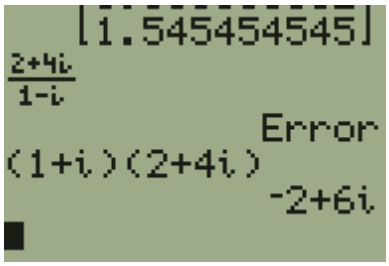
A $-2+6i$

B $-1+3i$

C $1+5i$

D $2-4i$

$\frac{2+6i-4}{2} = \frac{-2+6i}{2}$ $-1+3i$



Dec 11-9:49 AM

38. Which of the following is a fifth degree trinomial with a quadratic term and a negative leading coefficient?

F ~~$-1+2x^5+13x^2$~~

G ~~$3x^5-8x^3+2$~~

H $3x^2-x^5+12$

J ~~$x-x^2-6x^4$~~

Dec 11-9:49 AM

40. Which of the following is equal to $(2p - 3t)^4$?

F ~~$16p^4 - 81t^4$~~

G $16p^4 - 24p^3t + 36p^2t^2 - 24pt^3 + 81t^4$

H $16p^4 - 24p^3t + 36p^2t^2 - 54pt^3 + 81t^4$

J $16p^4 - 96p^3t + 216p^2t^2 - 216pt^3 + 81t^4$

$(2p-3t)(2p-3t)(2p-3t(2$

$(4p^2-12pt+9t^2)(4p^2-12pt+9t^2)$

$16p^4-48p^3t+36p^2t^2-48p^3t+144p^2t^2-108pt^3+36p^2t^2-108pt^3+81t^4$

Dec 11-9:49 AM

41. Which of the following is NOT a factor of $(x^4 - 4x^3 - 5x^2 - 36x - 36)$?

A $x - 2$

B $x + 2$

C $x - 3$

D $x + 3$

2	1	-4	-5	-36	-36
		2	-4	-18	-108
	1	-2	-9	-54	-144

Dec 11-9:50 AM

42. If $(2-\sqrt{2})$ and $(3+\sqrt{2})$ are two of the roots of a fourth degree polynomial with integer coefficients, which of the following is the product of the other two roots?

$(2+\sqrt{2})$ $(3-\sqrt{2})$

F $4-\sqrt{2}$

G $4+\sqrt{2}$

H $8-5\sqrt{2}$

J $8+5\sqrt{2}$

$(2+\sqrt{2})(3-\sqrt{2})$

$6-2\sqrt{2}+3\sqrt{2}-2$

$4+1\sqrt{2}$

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$[4, 24)$

$\{x \mid 4 \leq x < 24\}$

$\{x \mid x \geq 5\}$

$[5, \infty)$

Dec 15-10:57 AM

43. Which of the following lists all the roots of $x^3 + 3x = 9 + 3x^2$?

A $\{3\}$

B $\{3, \pm\sqrt{3}\}$

C $\{3, \pm\sqrt{3}i\}$

D $\{3, \pm\sqrt{3}, \pm\sqrt{3}i\}$

$\pm 1, 3, 9$ / ± 1

$x^3 - 3x^2 + 3x - 9$

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

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

$x^2 + 3 = 0$

$\sqrt{x^2} = \sqrt{-3}$

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

Cumulative Test

1. C	25. A
2. F	26. J
3. C	27. D
4. H	28. F
5. C	29. C
6. F	30. G
7. D	31. C
8. F	32. J
9. B	33. B
10. H	34. F
11. C	35. D
12. G	36. J
13. B	37. B
14. F	38. H
15. B	39. A
16. J	40. J
17. A	41. A
18. G	42. G
19. A	43. C
20. G	44. F
21. B	
22. F	
23. D	
24. H	

Dec 11-9:50 AM

44. If $f(x) = 2x^3 - x^2 - x - 4$, what is the y-intercept of $g(x) = f(x - 2)$?

F -22

G -18

H -14

J -10

X	Y1
-.5	-39
-.25	-29.59
0	-22
.25	-16.03
.5	-11.5
.75	-8.219
1	-6

X = -.5

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

Dec 11-9:50 AM

1. C
2. F
3. C
4. H
5. C
6. F
7. D
8. F
9. B
10. H
11. C
12. G
13. B
14. F
15. B
16. J
17. A
18. G
19. A
20. G
21. B
22. F
23. D
24. H
25. A
26. J
27. D
28. F
29. C
30. G
31. C
32. J
33. B
34. F
35. D
36. J
37. B
38. H
39. A
40. J
41. A
42. G
43. C
44. F

Dec 15-10:33 AM

Dec 15-1:14 PM