DIRECTIONS

This section of the test is 80 items, which you will work in this booklet. Mark the correct answer as directed by your teacher. You may use a calculator that has been approved by your teacher. Only your test booklet and calculator may be used; no other materials should be on your desk.

Solve each by factoring.

1 $6x^2 + 7x = 3$

$6x^2+7x-3=0$ (-18) $-16 \mid +2$ $9 \cdot -2 \mid 9+-2$

$6x^2-2x+9x-3=0$

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

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

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

$x=-3/2$ $x=1/3$

A. $-\frac{1}{3}, \frac{3}{2}$ **B.** $\frac{1}{3}, -\frac{3}{2}$ **C.** $1, \frac{1}{2}$ **D.** $-1, -\frac{1}{2}$

2 $4y = 9y^2$ $9y^2-4y=0$ $y(9y-4)=0$ $y=0$ $9y-4=0$ $y=4/9$

A. $\frac{4}{9}$ **B.** 0 **C.** $0, -\frac{4}{9}$ **D.** $0, \frac{4}{9}$

Find the value of c that makes each trinomial a perfect square.

3 $x^2 - 60x + c$ $\left(\frac{60}{2}\right)^2 = 30^2 = 900$

A. 30 **B.** 900 **C.** 3600 **D.** 450

4 $x^2 + \frac{r}{s}x + c$ $\left(\frac{r}{s}\cdot\frac{1}{2}\right)^2 = \frac{r^2}{2^2s^2} = \frac{r^2}{4s^2}$

A. $\frac{r^2}{s^2}$ **B.** $\frac{r^2}{2s^2}$ **C.** $\frac{r}{2s}$ **D.** $\frac{r^2}{4s^2}$

5 Describe the nature of the roots of the equation $6x^2 - 2x - 4 = 0$

Discriminant b^2-4ac

$(-2)^2-4(6)(-4)$

$4+96$

$100 =$

If Discriminant is
>0 & a perfect sq = 2 ℝ Rat.
>0 & not per. sq = 2 ℝ Irrat
$=0$ 1 ℝ Rat
<0 2 complex (Imag.)

A. 1 real root

B. 2 real, rational roots

C. 2 real, irrational roots

D. 2 complex roots

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6 Give the value of the discriminant and describe the nature of the roots of the equation $4x^2 - 8x = -4$

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

b^2-4ac

$(-8)^2-4(4)(4)$

$64-60$

0

A. 0; 1 real root

B. 128; 2 real, irrational roots

C. -128, 2 complex roots

D. 128; 2 real, rational roots

7 Find the sum and product of the roots of the equation $4x^2 - 8x - 12 = 0$

$\text{Sum} = -\frac{b}{a} = -\frac{(-8)}{4} = 2$

$\text{Product} = \frac{c}{a} = \frac{-12}{4} = -3$

A. sum: -3, product: 2

B. sum: 3, product: 2

C. sum: 2, product: -3

D. sum: -2, product: -3

8 Which equation has the solution set $\left\{\frac{3}{5}, -\frac{5}{8}\right\}$?

$x = \frac{3}{5}$ $\quad x = \frac{-5}{8}$

$5x = 3$ $\quad 8x = -5$

$-3 \quad -3$ $\quad -5 \quad +5$

$5x-3=0$ $\quad 8x+5=0$

$(5x-3)(8x+5)=0$ FOIL

$40x^2+25x-24x-15=0$

$40x^2+x-15=0$

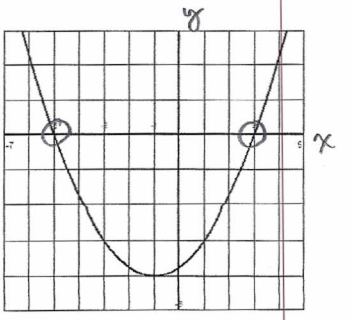
A. $40x^2 + 49x + 15 = 0$

B. $x^2 + \frac{49}{40}x - \frac{5}{8} = 0$

C. $40x^2 + x - 15 = 0$

D. $40x^2 + x + 15 = 0$

9 The graph of a quadratic function is shown below. What are the solutions of the related quadratic equation?



A. -4, -1

B. 3, -5

C. -3, 5

D. -1, -4

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15 Find the standard deviation of {8, 3, 2, 5, 6, 4, 5, 7, 3, 6}

A. 1.8 **B.** 2.8 **C.** 2.2 **D.** 2.4

16 Find the standard deviation of {7, 2, 2, 4, 5, 3, 4, 6, 2, 5}

A. 1.7 **B.** 2.8 **C.** 2.2 **D.** 2.4

Put in Calc
STAT
1: EDIT
Enter given #s into L1
2nd QUIT
STAT
Move 1 right to CALC
1: 1-var Stats
ENTER
σx is the st. dev.

17 Find the distance between the points (2, 5) and (-4, 1). $x_1\ y_1$ $x_2\ y_2$

A. $\sqrt{34}$ **B.** $2\sqrt{13}$ **C.** $4\sqrt{2}$ **D.** $6\sqrt{2}$

$d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
$d = \sqrt{(-4-2)^2+(1-5)^2}$
$d = \sqrt{52} = \sqrt{4\cdot13} = 2\sqrt{13}$

18 What is the midpoint of the line segment joining (3, 7) and (7, -4). $x_1\ y_1$ $x_2\ y_2$

A. (10, 3) **B.** $\left(5, \frac{3}{2}\right)$ **C.** (-4, 11) **D.** $\left(-2, -\frac{11}{2}\right)$

Midpt $= \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$
$= \left(\frac{3+7}{2}, \frac{7+(-4)}{2}\right)$
$= (5, 3/2)$

19 Simplify the expression $\frac{8}{3y}+\frac{2}{9}-\frac{3}{10y^2}$. LCD $= 90y^2$

A. $\frac{13}{22y^3}$

$\frac{30y}{30y}\cdot\frac{8}{3y} + \frac{2}{9}\cdot\frac{10y^2}{10y^2} - \frac{3}{10y^2}\cdot\frac{9}{9}$

B. $\frac{240y+20y^2-27}{90y^2}$

$\frac{240y+20y^2-27}{90y^2}$

C. $\frac{48}{270y^3}$

D. $\frac{17y+15y^2-8}{27y^2}$

20 Solve the equation $\frac{5}{6+r}+\frac{5}{6-r}=3$. Check your solution. LCD : $(6+r)(6-r)$

A. $r=4, r=-4$

$(6+r)(6-r)\left(\frac{5}{6+r}+\frac{5}{6-r}\right) = 3\ (6+r)(6-r)$
$5(6-r)+5(6+r) = 3(36-6r+6r-r^2)$
$30-5r+30+5r = 108-3r^2$
$60 = 108-3r^2$
$-48 = -3r^2$
$16 = r^2$
$r = \pm 4$

B. $r=6, r=-6$

C. $r=4$

D. $r=3, r=-3$

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21 Find the center of the circle with equation $x^2 + y^2 - 4x + 6y + 1 = 0$.

$x^2-4x+\underline{4}+y^2+6y+\underline{9}=-1+\underline{4}+\underline{9}$

$(x-2)^2+(y+3)^2=12$

A. (2, -3) **B.** (2, 3) **C.** (-2, -3) **D.** (-2, 3)

22 Find the radius of the circle with equation $x^2 + y^2 + 2x - 8y - 4 = 0$.

$x^2+2x+\underline{1}+y^2-8y+\underline{16}=4+\underline{1}+\underline{16}$

$(x+1)^2+(y-4)^2=21$

$r=\sqrt{21}$

A. 4 **B.** 2 **C.** 21 **D.** $\sqrt{21}$

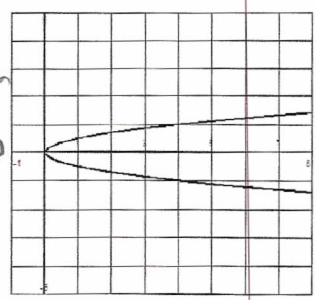
23 Which equation is shown by the graph?

A. $y = 4x^2$

B. $x = 4y^2$ ← Makes graph "thinner" - stretch x= since it is horizontal

C. $y = \frac{1}{4}x^2$

D. $x = \frac{1}{4}y^2$



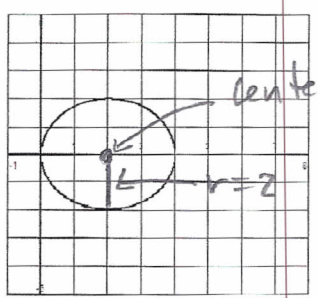
24 Which equation is shown by the graph?

A. $(x + 2)^2 + y^2 = 4$

B. $(x - 2)^2 + y^2 = 4$

C. $x^2 + (y - 2)^2 = 4$

D. $x^2 + (y + 2)^2 = 4$



25 Find the center of the ellipse with the equation $3x^2 + 4y^2 + 18x - 32y - 5 = 0$

$3x^2+18x+4y^2-32y=5$

$3(x^2+6x+\underline{9})+4(y^2-8y+\underline{16})=5+\underline{3\cdot9}+\underline{4\cdot16}$

(-3,4)

$3(x+3)^2+4(y-4)^2=96$

$\frac{96}{96}$ $\frac{96}{96}$ $\frac{96}{96}$

$\frac{(x+3)^2}{32}+\frac{(y-4)^2}{24}=1$

A. $(3,-4)$ **B.** $(-3,4)$ **C.** $(4,-3)$ **D.** $(-4,3)$

26 Write the equation of the parabola $y = -2x^2 + 4x + 1$ in vertex form.

$y-1=-2x^2+4x$

$y-1=-2(x^2-2x+\underline{1})$

$+(-2)(1)$

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

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

A. $y = -2(x+1)^2 + 3$ **C.** $y = -2(x-1)^2$

B. $y = -2(x+1)^2 - 3$ **D.** $y = -2(x-1)^2 + 3$

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27 Write a polynomial function of least degree with integral coefficients, the zeros of which include -1, and $5-i$. , $5+i$

$f(x) = (x+1)(x-5+i)(x-5-i)$, FOIL

$= (x+1)(x^2-10x+25-i^2)$

$= (x+1)(x^2-10x+26)$

$= x^3-10x^2+26x+x^2-10x+26$

$= x^3-9x^2+16x+26$

A. $f(x)=(x+1)(x-5+i)$

B. $f(x)=-8x^2+16x+26$

C. $f(x)=x^3-9x^2+16x+26$

D. $f(x)=2x^3+9x^2-8x+2$

28 Find the vertices of the hyperbola with equation $\frac{(x-3)^2}{25} - \frac{(y+4)^2}{4} = 1$

Horizontal Hyperbola since $\frac{(x-3)^2}{25}$ is pos

$a=\sqrt{25}=5$ ± 5 to the x-coord. of Center.

$(3,-4)$ ± 5 $(8,-4)$ $(-2,-4)$

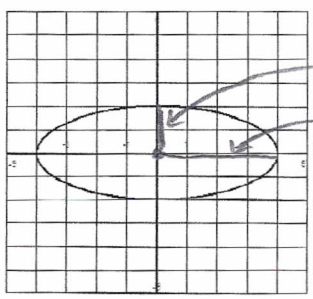
A. (8, -4) and (-2, -4)

B. (5, -4) and (1, -4)

C. (3, -2) and (3, -6)

D. (3, 1) and (3, -9)

29 Which equation is shown by the graph?



Center at (0,0)

$b=2$

$a=4$

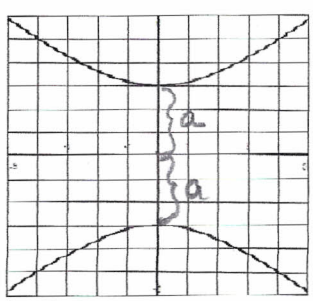
A. $\frac{x^2}{16} + \frac{y^2}{4} = 1$

B. $\frac{x^2}{4} + \frac{y^2}{16} = 1$

C. $\frac{x^2}{16} - \frac{y^2}{4} = 1$

D. $\frac{y^2}{16} - \frac{x^2}{4} = 1$

30 Which equation is shown by the graph?



Vertical Hyperbola

Center at (0,0)

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

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

$a=\sqrt{9}=3$

A. $x^2-y^2=9$

B. $y^2-x^2=9$

C. $x^2+y^2=9$

D. $x^2 \quad y^2=3$

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31 Solve the system of equations. $x^2 + y^2 = 25$ $9y = 4x^2$

A. (4, 3) and (-4, 3) **C.** (4, 3) and (4, -3)

B. (3, 4) and (3, -4) **D.** (4, 3) and (-3, 4)

32 What is the graph of $4x^2 = y^2 + 8y + 32$

A. Parabola **B.** Circle **C.** Ellipse **D.** Hyperbola

33 What is the graph of $5x^2 + 10x + 5y^2 = 9$

A. Parabola **B.** Circle **C.** Ellipse **D.** Hyperbola

34 What is the graph of $4x^2 = y - 24x + 35$

A. Parabola **B.** Circle **C.** Ellipse **D.** Hyperbola

35 Find $f(x + h)$ for the function $f(x) = 3x^2 - 5x$.

A. $3x^2 + 3h^2 - 5x - 5h$

B. $3x^2 + 6xh + h^2 - 5x - 5h$

C. $3x^2 + 6xh + 3h^2 - 5x - 5h$

D. $3x^2 + 6xh + 3h^2 - 5x + 5h$

36 Divide using synthetic division and write your answer in the form: *dividend = quotient · divisor + remainder.* $(2x^4 + 6x^3 + 5x - 6) \div (x + 2)$

A. $2x^4 + 6x^3 + 5x - 6 = (2x^3 + 2x^2 - 4x + 13)(x + 2) - 32$

B. $2x^4 + 6x^3 + 5x - 6 = (2x^2 + 2x + x - 8)(x + 2)$

C. $2x^4 + 6x^3 + 5x - 6 = (2x^2 + 2x + x)(x + 2) - 8$

D. $2x^4 + 6x^3 + 5x - 6 = (2x^3 + 2x^2 + x)(x + 2) - 8$

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37 Use synthetic substitution to find *f*(-3) for $f(x) = x^4 - x^3 + 4x^2 - 8x + 1$.

A. 67 **B.** -119 **C.** -23 **D.** 169

38 One factor of $2x^3 + x^2 + 8x + 4$ is $x + 2i$. What are the other two?

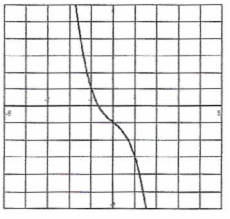
A. $x - 2i, 2x + 1$

B. $x + 2i, 2x + 1$

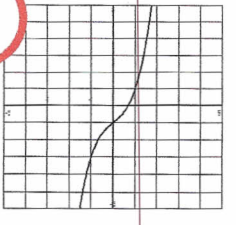
C. $x - 2i, 2x - 1$

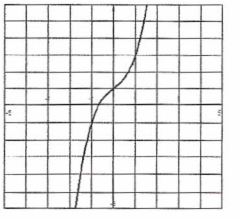
D. $x - 2i, x + 2$

39 Which of the following is the graph of $f(x) = x^3 + x - 1$

A. 

B. 

C. 

D. 

40 What are all the zeros for $f(x) = x^3 + x^2 - 15x + 25$ if $2 + i$ is one zero?

A. 2 + *i*, 2 – *i*, -5

B. 2 + *i*, 2 – *i*, 5

C. 2 + *i*, 2 – *i*, -5, 5

D. 2 + *i*, -5, 5

41 What are all of the zeros for $f(x) = x^3 - 12x^2 + 49x - 68$ if 4 is one of the zeros?

A. $4 \pm i$ **B.** -4 **C.** $8 \pm 3i$ **D.** $-4, 0$

42 Find all rational zeros for the function $f(x) = 6x^4 + x^3 + 22x^2 + 4x - 8$

A. $2, -\frac{3}{2}$ **B.** $-\frac{1}{2}, \frac{2}{3}$ **C.** $\frac{1}{2}, -\frac{2}{3}, 2i, -2i$ **D.** $\frac{1}{2}, -\frac{2}{3}$

graph

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Solve the equation.

43 $x^4 - 14x^2 - 95 = 0$

Let $a = x^2$, $a^2 = x^4$

$a^2 - 14a - 95 = 0$

x	+
-95	-14
-19 · 5	-19 + 5

$a = 19$ $a = -5$

$x^2 = 19$ $x^2 = -5$

$x = \pm\sqrt{19}$ $x = \pm i\sqrt{5}$

A. $\sqrt{19},\ i\sqrt{5}$ **B.** $\pm\sqrt{19}$ **C.** 19, -5 **D.** $\pm\sqrt{19},\ \pm i\sqrt{5}$

Solve the equation.

44 $y^{\frac{2}{3}} + 9y^{\frac{1}{3}} + 8 = 0$

Let $a = y^{1/3}$ $a^2 = y^{2/3}$

$a^2 + 9a + 8 = 0$

x	+
8	9
8 · 1	8 + 1

$a = -8$ $a = -1$

$y^{1/3} = -8$ $y^{1/3} = -1$

$(y^{1/3})^3 = (-8)^3$ $(y^{1/3})^3 = (-1)^3$

$y = -512$ $y = -1$

A. -1, -512 **B.** -1, -2 **C.** 1, 2 **D.** Ø

45 $x - 5\sqrt{x} + 4 = 0$

Let $a = \sqrt{x}$ $a^2 = x$

$a^2 - 5a + 4 = 0$

x	+
4	-5
-4 · -1	-4 + -1

$a = 4$ $a = 1$

$\sqrt{x} = 4$ $\sqrt{x} = 1$

$(\sqrt{x})^2 = 4^2$ $(\sqrt{x})^2 = 1^2$

$x = 16$ $x = 1$

A. 1 **B.** 1, 4 **C.** 16 **D.** 1, 16

46 If $f(x) = x^2 - 1$ and $g(x) = x + 3$, what is $g(f(-3))$?

$f(-3) = (-3)^2 - 1 = 8$ $g(f(-3)) = (8) + 3 = 11$

A. -1 **B.** 11 **C.** -7 **D.** 35

47 Find $f(g(x))$ if $g(x) = 2x + 1$ and $f(x) = x^2 + 3$.

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

$= 4x^2 + 4x + 1 + 3$

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

A. $4x^2 + 2x + 4$

B. $4x^2 + 4$

C. $4x^2 + 4x + 4$

D. $2x^2 + 7$

48 Find the first four iterates of $f(n) = f(n - 1) + 3$, given the initial value $f(0) = -1$.

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

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

$f(3) = f(2) + 3 = 5 + 3 = 8$

$f(4) = f(3) + 3 = 8 + 3 = 11$

A. 0, -1, 2, 5

B. -1, 2, 5, 8

C. 2, 5, 8, 11

D. -1, -3, -9, -27

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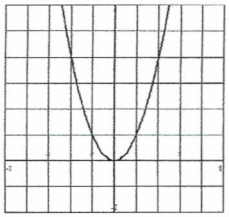
49 Which is the graph of the inverse of $y = x^2 - 1$?

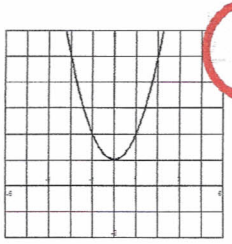
Interchange x & y

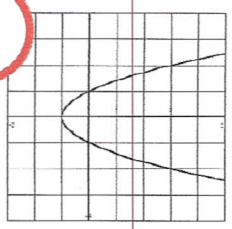
$x = y^2 - 1$

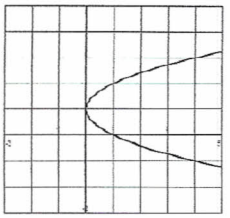
$x + 1 = y^2$

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

A. 

B. 

C. 

D. 

50 Find the inverse of $f(x) = \dfrac{5x - 7}{2}$.

Interchange x & y

$x = \dfrac{5y - 7}{2}$

$2x = 5y - 7$

$2x + 7 = 5y$

$y = \dfrac{2x + 7}{5}$

A. $f^{-1}(x) = \dfrac{2x + 7}{5}$

B. $f^{-1}(x) = \dfrac{5x + 7}{2}$

C. $f^{-1}(x) = \dfrac{-5x + 7}{2}$

D. $f^{-1}(x) = \dfrac{-2x + 7}{5}$

51 What is the simplest form of $\dfrac{(3xy^3)^2}{9x^4y}$?

$\dfrac{9x^2y^6}{9x^4y} = \dfrac{y^5}{x^2}$ Subt. Exp.

A. $\dfrac{2y^5}{3x^2}$ **B.** $\dfrac{y^4}{3x^3}$ **C.** $\dfrac{x^2}{y^5}$ **D.** $\dfrac{y^5}{x^2}$

52 Simplify $\left(\dfrac{2a}{b}\right)^3 \cdot \left(\dfrac{b^2}{8}\right)$.

$\dfrac{8a^3}{b^3} \cdot \dfrac{b^2}{8} = \dfrac{a^3}{b}$

A. $\dfrac{a^3}{b}$ **B.** $\dfrac{a}{b^3}$ **C.** $\dfrac{3a^3}{4b}$ **D.** $\dfrac{4b}{3a^3}$

53 Simplify $\dfrac{x^2 + 5x + 4}{x^2 + 2x + 1} \cdot \dfrac{2x + 2}{x + 4}$

$\dfrac{(x+4)(x+1)}{(x+1)(x+1)} \cdot \dfrac{2(x+1)}{(x+4)} = 2$

A. $\dfrac{1}{2}$ **B.** 2 **C.** $\dfrac{(x+4)^2}{2(x+1)^2}$ **D.** $\dfrac{x+4}{2(x+1)}$

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54 Which of the following is an equation of a vertical asymptote for the graph of $f(x) = \dfrac{x^2 + 5x + 6}{x - 1}$?

$x - 1 = 0 \quad x = 1$

A. x = 1 **B.** x = -2 **C.** x = -2 or x = -3 **D.** y = 1

55 Simplify $\dfrac{x^2 - 9}{x^2 - 5x + 6} \div \dfrac{x^2 + 5x + 6}{x^2 - 4}$

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

A. $\dfrac{(x+3)^2}{(x-2)^2}$ **B.** -1 **C.** $\dfrac{x+2}{x-2}$ **D.** 1

56 Two fractions have denominators of $x^2 + 6x + 9$ and $x^2 - 9$. What is the least common denominator?

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

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

A. $x^2 - 9$

B. $x^2 + 6x + 9$

C. $2x^2 + 6x$

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

57 Simplify $\dfrac{y}{9y^2 - 9} + \dfrac{4}{y^2 + 2y + 1}$.

$\dfrac{y}{9(y^2-1)} + \dfrac{4}{(y+1)(y+1)}$ LCD: $9(y+1)^2(y-1)$

A. $\dfrac{y^2 + 37y - 36}{9(y+1)^2(y-1)}$

$\dfrac{(y+1)}{(y+1)} \dfrac{y}{9(y+1)(y-1)} + \dfrac{4}{(y+1)(y+1)} \cdot \dfrac{9(y-1)}{9(y-1)}$

$\dfrac{y^2 + y + 36y - 4}{9(y+1)^2(y-1)} = \dfrac{y^2 + 37y - 4}{9(y+1)^2(y-1)}$

B. $\dfrac{y+4}{10y^2 + 2y - 8}$

C. $\dfrac{y+4}{9(y+1)^2(y-1)}$

D. $\dfrac{y^2 + 38y - 35}{9(y+1)^2(y-1)}$

58 Simplify $\frac{6n}{n^2 - 9} - \frac{3}{n+3}$.

$\frac{6n}{(n+3)(n-3)} - \frac{3}{n+3} \cdot \frac{(n-3)}{(n-3)}$

$\frac{6n - 3n + 9}{(n+3)(n-3)} = \frac{3n+9}{(n+3)(n-3)}$

$= \frac{3(n+3)}{(n+3)(n-3)}$

$= \frac{3}{n-3}$

A. $\frac{3}{n+3}$

B. $\frac{3}{n-3}$

C. $\frac{6n-3}{n^2 - n + 12}$

D. $\frac{6n-3}{n^2 - 9}$

59 Which of the following is an equation of the horizontal asymptote for the graph of $f(x) = \frac{2x+6}{x-1}$?

$y = \frac{2x}{x} \rightarrow y = 2$

A. y = 2 **B.** y = 0 **C.** x = 1 **D.** y = 1

60 What is the solution set of $7x + 29 = -\frac{30}{x}$? $\times x$

$7x^2 + 29x = -30$

$7x^2 + 29x + 30 = 0$

x	+
210	29
15·14	15+14

$x = \frac{-15}{7}$ $x = \frac{-14}{7}$

$x = -2$

A. $\left\{-\frac{6}{7}, 5\right\}$ **B.** $\left\{\frac{6}{7}, -5\right\}$ **C.** $\left\{-\frac{15}{7}, -2\right\}$ **D.** $\varnothing$

61 What is the solution set of $\frac{n}{n-4} + n = \frac{12 - 4n}{n-4}$? $(n-4)$

$n + n(n-4) = 12 - 4n$

$n + n^2 - 4n = 12 - 4n$

$n^2 - 3n = 12 - 4n$

$n^2 + n - 12 = 0$

x	+
-12	1
4, -3	

$n = -4 \quad n = 3$

A. $\{-4, 3\}$ **B.** $\{4, -3\}$ **C.** $\{-4\}$ **D.** $\{3\}$

62 If y varies inversely as x and $y = \frac{2}{3}$ when x = -10, what is y when x = 15?

$\frac{y_1}{x_2} = \frac{y_2}{x_1}$

$\frac{2/3}{15} = \frac{y}{-10}$

$15y = -\frac{20}{3}$

$45y = -20$

$y = \frac{-20}{45}$

$y = -\frac{4}{9}$

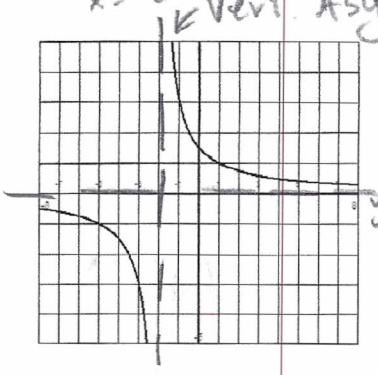
A. $\frac{4}{9}$ **B.** $-\frac{4}{9}$ **C.** -1 **D.** -100

63 If y varies directly as x and y = 4 when x = -2, what is y when x = 30?

$\frac{y_1}{x_1} = \frac{y_2}{x_2}$ $\frac{4}{-2} = \frac{y}{30}$ $-2y = 120$ $y = -60$

A. $-\frac{14}{15}$ **B.** 60 **C.** -60 **D.** $\frac{14}{15}$

64 Which equation represents the graph shown?



Vert Asymptote at $x=-2$ denom is $x+2$

Horizontal asymptote at $y=0$ since $\frac{3}{x+2}=0$

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

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

C. $y=\frac{x}{x+2}$

D. $y=\frac{x}{x-2}$

65 If y varies jointly as x and z and y = 60 when x = 10 and z = -3, find y when x = 8 and z = 15.

$y=kxz$

$60=k(10)(-3)$ $k=-2$

$y=-2(8)(15)=-240$

A. -240 **B.** 15 **C.** 240 **D.** -15

66 Solve $8^{x+2}=32^{2x+4}$

$2^{3(x+2)}=2^{5(2x+4)}$

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

$3x+6=10x+20$

$7x=-14$

$x=-2$

A. -2 **B.** -1 **C.** 0 **D.** 1

67 Evaluate $\log_2 8=x$

$2^x=8$ $2^x=2^3$ $x=3$ or put in calculator

$Y_1=\log(8)/\log(2)$

A. 3 **B.** 4 **C.** 16 **D.** 64

68 Solve $\log_3 n=2$

$3^2=n$ $9=n$

A. 5 **B.** 6 **C.** 8 **D.** 9

69 Solve $\frac{1}{2}\log_7 x=4\log_7 2-\log_7 4$

$\log_7 x^{1/2}=\log_7 2^4-\log_7 4$

$\log_7 x^{1/2}=\log_7\left(\frac{16}{4}\right)$

$\log_7 x^{1/2}=\log_7 4$

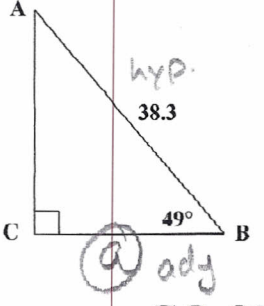
$x^{1/2}=4$

$(x^{1/2})^2=4^2$

$x=16$

A. 2 **B.** 4 **C.** 16 **D.** 32

70 Find the length of a.



$\cos 49^\circ=\frac{a}{38.3}$

$38.3\cos 49^\circ=a$

$a=25.1$

A. 25.1 **C.** 50.7

B. 28.9 **D.** 58.4

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71 What is 100° expressed in radians?

$100^\circ \times \frac{\pi}{180^\circ} = \frac{100\pi}{180} = \frac{5\pi}{9}$

A. $\frac{9\pi}{5}$ **B.** $\frac{5\pi}{9}$ **C.** 1.74 **D.** $\frac{18000}{\pi}$

72 What is $\frac{5\pi}{4}$ expressed in degrees?

$\frac{5\pi}{4} \times \frac{180^\circ}{\pi} = 225^\circ$

A. 3.9° **B.** 102.5° **C.** 225° **D.** 405°

73 Find the exact value of $\cos 30^\circ$

A. 1 **B.** $\frac{1}{2}$ **C.** $\frac{\sqrt{2}}{2}$ **D.** $\frac{\sqrt{3}}{2}$

74 Find the exact value of $\sin 45^\circ$

A. 1 **B.** $\frac{1}{2}$ **C.** $\frac{\sqrt{2}}{2}$ **D.** $\frac{\sqrt{3}}{2}$

75 Find the exact value of $\cos\frac{3\pi}{2}$ Radians

A. 1 **B.** 0 **C.** $\frac{\sqrt{2}}{2}$ **D.** $\frac{1}{2}$

76 Find the exact value of $\tan\frac{2\pi}{3}$ Radians

A. $\frac{1}{2}$ **B.** $\sqrt{3}$ **C.** $-\frac{\sqrt{3}}{3}$ **D.** $-\sqrt{3}$

77 Find the inverse of the function $y = \frac{2x-1}{3}$

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

A. $y^{-1} = \frac{3x+1}{2}$ **B.** $y^{-1} = \frac{3x}{2} - 1$ **C.** $y^{-1} = x + 3$ **D.** $y^{-1} = 3x + 1$

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78 Find the number of positive real zeros, negative real zeros, and imaginary zeros of $f(x) = x^3 - 2x^2 + 2x - 6$.

3 or 1 pos zeros $f(-x) = -x^3 - 2x^2 - 2x - 6$ No sign change = no neg roots

A.	Pos: 3 or 1, Neg: 0, Imag: 0 or 2	**C.**	Pos: 2 or 0, Neg: 1, Imag: 0 or 2
B.	Pos: 3 or 1, Neg: 1 or 3, Imag: 0	**D.**	Pos: 2 or 0, Neg: 0, Imag: 2

+	−	i	T
3	0	0	3
1	0	2	3

79 Find the remainder if $f(x) = 3x^4 - 2x^3 + 5x + 2$ is divided by $x - 4$.

A. -600 **B.** 227 **C.** 662 **D.** 4

4 | 3 −2 0 5 2
12 40 160 660
3 10 40 165 | 662

80 Solve $27^{x+2} = 9^{2x+5}$

A. $\frac{1}{2}$ **B.** −4 **C.** −3 **D.** −2

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

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

$3x + 6 = 4x + 10$

$-4 = x$

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