MATH 1111 Formulas

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

$y = m(x - x_1)^2 + bx + c$

$f(x) = a(x - h)$

$^2 + k$

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Math 1111 - Final Exam

Name _____

Date _____

Do all work on this test booklet.

Multiple Choice (3 points each): Choose the correct answer and write the corresponding letter on the blank or bubble it in on the scantron sheet, if provided.

_____1.) If you rent a van for one day and drive it 250 miles, the cost is $100. If you drive it 300 miles, the cost is $115. Let x represent the miles driven, and let y represent the cost. Find a linear equation represented by this data.

a.) $y = \$0.30x + \$25$
b.) $y = \$3.10x - \$650$
c.) $y = \$0.40x$
d.) $y = \$0.50x + \$50$

_____2.) Find the vertex of $f(x) = 3x^2 + 30x + 78$
a.) (3, -5)
b.) (-3, 5)
c.) (5, -3)
d.) (-5, 3)

_____3.

_____4.) An initial investment of $1000 is appreciated for 10 years in an account that earns 9% interest, compounded annually. Find the total amount of money in the account at the end of the period.

a.) $ 2367.36
b.) $ 1367.36
c.) $ 2580.43
d.) $ 2171.89

_____5.) Evaluate $\log_8 32$

a.) 4 b.) 40 c.) 5/3 d.) 3/5

_____6.) Solve: $6 - 8x > 12$

a.) $\left\{x \mid x < \frac{-9}{4}\right\}$

b.) $\left\{x \mid x < \frac{-3}{4}\right\}$

c.) $\left\{x \mid x > \frac{-9}{4}\right\}$

d.) $\left\{x \mid x < \frac{3}{2}\right\}$

_____7.) Divide. Write answer in standard form. $\frac{2-3i}{4+5i}$

a.) $\frac{8-22i+15i^2}{41}$

b.) $-\frac{7}{41}-\frac{22}{41}i$

c.) $\frac{23}{9}+\frac{22}{9}i$

d.) $\frac{23}{9}-\frac{2}{9}i$

_____8.) Solve by quadratic formula: $4x^2 - 2x - 1 = 0$

a.) $\left\{\frac{-1 \pm \sqrt{5}}{4}\right\}$

b.) $\left\{\frac{1 \pm \sqrt{5}}{4}\right\}$

c.) @) ⌡ !f ™y&)˜R ƒ5Wbviy&) ƒ,ÀÀÆ 0 …! 3Uv 3 ¿

_____12.) Find the exact distance between (4,1) and (-3,8).

a.) $\sqrt{130}$
b.) $7\sqrt{2}$
c.) 9
d.) $\sqrt{73}$

_____13.) Find the equation of the circle whose diameter has endpoints (0, 2) and (6,8).

a.) $(x - 3)^2 + (y - 5)^2 = 18$
b.) $(x + 3)^2 + (y + 5)^2 = \sqrt{18}$
c.) $x^2 + (y - 2)^2 = 72$
d.) $(x - 6)^2 + (y - 6)^2 = 16$

_____14.) Write the equation of the line perpendicular to $y = 6 - \frac{1}{2}x$ through (-4,7).

a.) $y = \frac{-1}{2}x + 5$
b.) $y = \frac{1}{2}x + 9$
c.) $y = 2x + 15$
d.) $y = -2x - 1$

_____15.) Which of the following is (are) even functions?

i. ii. $y = -x^3$ iii. $y = (x - 3)^2$

a.) i
b.) ii
c.) iii
d.) i and iii

_____ 16.) Find the domain and range of the piecewise defined function on the graph below:

a.) D: [-2,2], R: [0, 4]
b.) D: (-2, 1] [2, 4), R: [0, 4]
c.) D: [-2, 1] [0, 2], R: [2, 4]
d.) D: (-2, 4), R: [0,4]

_____ 17.) Given: $f(x) = 3x + 2$ and $g(x) = x^2 + 1$. Find: $g(f(x))$

_____24.) Solve: $\sqrt{x+2}=16$

_____25.) Solve: $\frac{3}{x+2}=-6$

_____26.) Write the equation, in slope intercept form, of the line through (1, -5) with slope = $\frac{2}{3}$.

_____ 27.) Solve: $\left(\frac{1}{4}\right)^{-7x+3}=(64)^{2x+1}$

_____ 28.) Find the exact solution for $\ln(x + 2) = -3$

_____29.) Find all solutions: $\log_2(x+8) = 4 - \log_2(x-7)$

_____ 30.) Solve the system: $3x + 2y = 18$
$4x - y = 6$
Answer should be exact.

Graphs (5 points each)

31.) Given: $y = (x + 1)^2 - 3$
Identify the vertex._____
Plot the vertex and at least 4 other points, then draw the graph.

32.) Given: $y = e^{x+1} - 2$.
Identify the asymptote. _____
Draw the asymptote, plot at least 4 points, then draw the graph.