Name: _____

Circle your answer for problems 1-3. <u>You must show correct work to receive credit.</u>

(8 pts) 1. Find the distance between the points $(-4,1)$ and $(2,-7)$.

A. 10

B. $2\sqrt{10}$

C. 14

D. $\sqrt{10}$

E. None of the above

(8 pts) 2. Write the following as a single logarithm:

$$3\log_2 x - \log_2(4x-1) + 2\log_2(x+5)$$

A. $\log_2\left(\dfrac{x^3}{(4x-1)(x+5)^2}\right)$

B. $\log_2(x+11)$

C. $\log_2\left(\dfrac{(x^3)(x+5)^2}{4x-1}\right)$

D. $\log_2\left(x^3+(x+5)^2-4x+1\right)$

E. $\log_2\left(\dfrac{(3x)(2x+10)}{4x-1}\right)$

(8 pts) 3. Find the center and the radius of the circle given by the equation:

$$x^2+y^2+8x-10y+37=0$$

A. Center $(4,-5)$; radius $=2$

B. Center $(-4,5)$; radius = 4

C. Center $(4,-5)$; radius = 4

D. Center $(-4,5)$; radius $=2$

E. None of the above

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Place your answer in the space provided. You must show your work to receive credit.

(10 pts) 4. Find an equation of the line which passes through the points $(2,-5)$ and $(-3,-1)$. Leave your answer in the form $Ax + By + C = 0$, where $A, B,$ and C are integers.

(12 pts) 5. Given $f(x) = 3x^2 - 4x - 5$ and $g(x) = 2x + 7$, find and simplify each of the following:

(4 pts) (a) $(f - g)(-1)$

$(f - g)(-1) =$

(4 pts) (b) $\left(\frac{f}{g}\right)(2)$

$\left(\frac{f}{g}\right)(2) =$

(4 pts) (c) $(g \circ f)(x)$

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

Place your answer in the space provided. You must show your work to receive credit.

(12 pts) 6. Solve each of the following equations for x:

(6 pts) (a) $\sqrt{2x-3} = 4$

$x =$

(6 pts) (b) $\log_3(x-5) = 2$

$x =$

(10 pts) 7. Simplify each of the following completely:

(4 pts) (a) $\sqrt{32} + \sqrt{50} - \sqrt{18}$ (Do not use a calculator to approximate the answer.)

(6 pts) (b) $\left(xy^{\frac{2}{3}}\right)^6 \left(x^{\frac{1}{2}}y^2\right)^8$

(10 pts) 8. Find the standard equation of the vertical parabola whose vertex is $(-4,5)$ and passes through the point $(1,-3)$.

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Place your answer in the space provided. You must show your work to receive credit.

(10 pts) 9. The population of a certain city is growing exponentially. The current population is 15,525 and it is growing at the rate of 3.2% per year. Find the population of this city after 18 years. Round your answer to the nearest whole number.

population =

(12 pts) 10. Metro Trucking advertised the rental cost of their economy size moving truck as $45 per day plus 20 cents per mile. For the same size truck, Champion Trucking charges $50 per day plus 15 cents per mile. Find all mileages for which Champion Trucking will be **less expensive** than Metro Trucking for a four-day rental?
(Name the variable, set up an **inequality**, and solve.)

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