

MATH 120
SPRING 2014
EXAM 1

NAME:

1. 10 pts. Evaluate $-s^2 - 8t + r^2$, given that $s = -2$, $t = 3$, and $r = -4$.
2. 10 pts. each Perform the indicated operation.

 - (a) $(u^3 - 2u^2 + 5) - 2(-7u^3 + 11u^2)$
 - (b) $(3v + 2)(4v^2 - 7v + 6)$
 - (c) $(a - 8b)^2$
3. 10 pts. Divide by long division: $\frac{8x^4 + 6x^2 - 3x + 1}{2x^2 - x + 2}$
4. 10 pts. each Fully factor each polynomial.

 - (a) $10ab - 6b + 35a - 21$
 - (b) $9z^2 + 4z - 2$
 - (c) $32a^2 + 48ab + 18b^2$
 - (d) $36k^2 - 81\ell^4$
 - (e) $1000x^3 + 343y^3$
5. 10 pts. each Find each product or quotient.

 - (a) $\frac{q^3 + q^2}{7} \cdot \frac{49}{q^4 + q^3}$
 - (b) $\frac{x^2 + x - 2}{x^2 + 3x - 4} \div \frac{x^2 + 3x + 2}{x^2 + 4x + 3}$
6. 10 pts. Find the sum: $\frac{5}{12x^2y} - \frac{7}{6xy^3}$
7. 10 pts. Simplify the complex fraction:

$$\frac{1 - \frac{2}{3x}}{9 - \frac{4}{x^2}}$$
8. 10 pts. Simplify, writing the answer using only positive exponents: $\frac{(r^{-1/5}s^{2/3})^{15}}{r^{-2}}$.

9. 10 pts. Factor $t^{-5} - 3t^{-3}$ using the common factor t^{-5} .
10. 10 pts. each Simplify each radical expression.
- (a) $\sqrt{25j^4k^2}$, given j and k are positive.
 - (b) $\sqrt{8x^2z^8}$, given x and z can be any real number.
 - (c) $\sqrt[3]{\frac{9}{16r^4}}$
 - (d) $\sqrt[4]{\sqrt[3]{12}}$
 - (e) $\sqrt[3]{32} - 5\sqrt[3]{4} + 2\sqrt[3]{108}$
11. 10 pts. Solve the equation: $4[2x - (3 - x) + 5] = -6x - 28$.
12. 10 pts. Solve for a : $ax + b = 3(x - a)$.
13. 15 pts. What quantity of a 60% acid solution must be mixed with 400 mL of a 45% acid solution to produce a 55% acid solution? (Round to the nearest tenth of a milliliter.)
14. 15 pts. Professor Emeritus Angus McPratt invested \$12,000, a portion earning a simple interest rate of 5.5% per year and the rest earning a rate of 4% per year. After one year the total interest earned on these investments was \$560. How much money did he invest at each rate?
15. 10 pts. each Perform the indicated operation and write the answer in the standard form for complex numbers.
- (a) $(3 - 6i) - (-8 - 13i)$
 - (b) $(4 - 3i)(2 + 9i)$
 - (c) $\frac{3 - 2i}{1 + i}$
 - (d) i^{355}