

MATH 120
SPRING 2016
EXAM 1

NAME:

1. 10 pts. Evaluate $x^2 + 7y - z^4$, given that $z = -2$, $y = 4$, and $x = -4$.
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: $\frac{(t^{-1/4}u^{2/3})^{12}}{4t^{-3}}$.

9. 10 pts. Factor $q^{-5} - 8q^{-11}$ using the common factor q^{-11} .
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) $\sqrt[5]{\sqrt[6]{60}}$
 - (e) $\sqrt[3]{32} - 5\sqrt[3]{4} - 8\sqrt[3]{108}$
11. 10 pts. Solve the equation: $4[2x - (2 - x) + 5] = -6x - 28$.
12. 10 pts. Solve for a : $ax + b = 4(x - 2a)$.
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. Bernie gets to work in 20 minutes when he drives his car. Riding his bike (by the same route) takes him 45 minutes. His average driving speed is 4.5 mph greater than his average speed on his bike. How far does he travel to work?
15. 10 pts. each Perform the indicated operation and write the answer in the standard form for complex numbers.
- (a) $(1 - 3i)(2 - 6i)$
 - (b) $\frac{3 - 2i}{1 + i}$
 - (c) i^{227}