

EMT111 Test I (Practice)

September 30, 2011

- Factor completely.
(a) $2x^2 - 3x - 2$ (b) $10x^8y^6 + 25x^2y^4 + 20x^3y^{10}$ (c) $s^3 - 1$
- Use Synthetic Division to find the quotient and remainder when $3x^2 + x + 7$ is divided by $(x + 2)$
- Find the remainder if $x^5 + 4x^2 - 5x + 1$ is divided by $(x - 1)$
- Simplify.
(a) $(2\sqrt{5} + 3)(3\sqrt{5} - 2)$ (b) $\log(x^2 + 3x + 2) - \log(x + 2)$ (c) (d) $10^{\log_5 25}$
- Solve for x .
(a) $2^{x-1} = 8$ (b) $10^{x+2} = 30$ (c) $\log_2 x = \log_4(x + 2)$
- Solve for x .
(a) $-3 \leq 5 - x \leq 5$ (b) $(x - 2)(x + 1) > 0$ (c) $\frac{2}{x} \leq \frac{3}{x+2}$
- A room is 1.5 times as long as it is wide. Its perimeter is 80 ft. How wide is the room?
- A 10-gram sample of a radioactive substance decays in such a way that the mass remaining after t days is given by $m(t) = 10e^{-t \ln 2}$ where $m(t)$ is measured in grams. After how many days is there only 5 g remaining?
- A jet flew from NY to LA, a distance of 4200 km. The speed for the return trip was 100 km/h faster than the outbound speed. If the total trip took 13 hours, what was the speed from NY to LA?
- A student makes and sells necklaces at a booth during Amerindian month. The material for each necklace costs her \$ 600 and she has been selling about 20 per day at \$1000 each. She has been wondering whether or not to raise the price, so she takes a survey and finds that for every \$ 100 increase she would lose only one sale a day. What price should she set for the necklaces to maximize her profit?

ANSWERS

- (a) $(2x + 1)(x - 2)$ (b) $5x^2y^4(2x^6y^2 + 5 + 4xy^6)$ (c) $(s - 1)(s^2 + s + 1)$
- Quotient is $3x - 5$. Remainder is 17.
- 1
- (a) $24 + 5\sqrt{5}$ (b) $\log(x + 1)$ (c) 100
- (a) $x = 4$ (b) $x = -0.5229$ (c) $x = 2$

6. (a) $x \in [0, 8]$ (b) $x \in (-\infty, -1) \cup (2, +\infty)$ (c) $x \in (-2, 0) \cup [4, +\infty)$
7. 16 ft
8. 1 day
9. 600 km/h
10. \$1800