Scores

part one: number correct Max10 x 4 = Max 40 minus number wrong _____ = Max 40 (A)

part two: Max 10(B) Total score (A)+(B) Max 50

Math Field Day Short Course Event Name KEY (Bob Furry)

50 points total School _____

Part one Instructions: Work alone or with a team. You should use the formulas provided, your calculator, and your notes. Record your answers by circling the letter to the right. Each correct answer is worth 4 points; one point will be deducted for each wrong answer. (Part one consists of 10 questions. Maximum score on part 1 is 40 points.)

	In problems 1 through 10 you are to choose the closest answer.	Circle the letter of the correct answer
1.	An individual wishes to deposit a certain quantity of money now so that at the end of 5 years he will have \$500.00. With interest at 4% per year, compounded semiannually, how much must he deposit now? (*a*) \$340.30 (*b*) \$400.00 (*c*) \$410.15 (*d*) \$416.95 (*e*) \$608.35	*a* *b* ⟨*c*⟩ *d* *e*
2.	A sum of \$1000.00 is borrowed for one year at an interest rate of 1% per month. If this same sum of money is borrowed for the same period at an interest rate of 12% per annum, the saving in interest charges would be: (*a*) \$ 0 (*b*) \$ 3 (*c*) \$ 5 (*d*) \$ 7 (*e*) \$ 14	*a* *b* *c* ⟨*d*⟩ *e*
3.	A certain piece of property is purchased for \$10,000 and yields a \$1000 yearly profit. If the property is sold after 5 years, what is the minimum price to break even, with interest at 6 percent? (*a*) \$5,000 (*b*) \$6,500 (*c*) \$7,745 (*d*) \$8,314 (*e*) \$10,000	*a* *b* ⟨*c*⟩ *d* *e*
4.	A steam boiler is purchased on the basis of guaranteed performance. A test indicates that the operating cost will be \$300 more per year than the manufacturer guaranteed. If the expected life of the boiler is 20 years and money is worth 8 percent, how much should the purchaser deduct from the purchase price to compensate for the extra operating cost? (*a*) \$2945 (*b*) \$3320 (*c*) \$4102 (*d*) \$5520 (*e*) \$6000	⟨*a*⟩ *b* *c* *d* *e*
5.	A bank pays one percent interest on savings accounts four times a year. The effective annual interest rate is: (*a*) 1.00 *percent* (*b*) 1.04 *percent* (*c*) 3.96 *percent* (*d*) 4.00 *percent* (*e*) 4.06 *percent*	*a* *b* *c* *d* ⟨*e*⟩
6.	How many months at an interest rate of 1 percent per month does money have to be invested before it will double in value? (*a*) 59 *months* (*b*) 62 *months* (*c*) 70 *months* (*d*) 76 *months* (*e*) 83 *months*	*a* *b* ⟨*c*⟩ *d* *e*

(over)

Scores

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Math Field Day Short Course Event Name KEY (Bob Furry)

	In problems 1 through 10 you are to choose the closest answer.	Circle the letter of the correct answer
7.	Given a sum of money Q that will be received six years from now. At 5 percent compound interest the present worth now of Q is $60.00. At this same interest rate, what would be the value of Q ten years from now? (a) $60.00 (b) $76.78 (c) $90.00 (d) $97.73 (e) $120.00	*a* *b* *c* ⟨*d*⟩ *e*
8.	A small South American country experiences inflation of 20% per month. The effective annual inflation rate is (a) 20% (b) 240% (c) 790% (d) 2400%	*a* *b* ⟨*c*⟩ *d*
9.	Annual maintenance costs for a particular section of highway pavement are $2000. The placement of a new surface would reduce the annual maintenance cost to $500 per year for the first 5 years and to $1000 per year for the next 5 years. The annual maintenance after 10 years would again be $2000. If maintenance costs are the only saving, what maximum investment can be justified for the new surface? Assume interest at 4%. (a) $5,500 (b) $7,170 (c) $10,000 (d) $10,340 (e) $12,500	*a* *b* *c* ⟨*d*⟩ *e*
10.	A personal computer system costs $18,000, and annual maintenance is $900. After 3 years the salvage value of the system is $3,000. If the interest rate is 8%, the equivalent uniform annual cost is (a) $6,960 (b) $6,922 (c) $7,288 (d) $7,499	⟨*a*⟩ *b* *c* *d*

Part two Instructions: Work alone or with a team. You should use the formulas provided, your calculator, and your notes. Put your answers to parts (a) and (b) in the spaces provided; Circle the correct answer to part (c). The problem is worth a total of 10 points. Four points each for parts (a) and (b); two points for part (c). No credit for 11(c) if answers to parts (a) and (b) are missing.

	Solve the following problem; enter the solutions in the column to the right. (Round to nearest $100.)	Enter the present worths in this column and circle the more economical alternative.
11.	An old light capacity highway bridge may be strengthened at a cost of $22,000, or it may be replaced by a new bridge at a cost of $40,000. It is estimated that the old bridge, when reinforced, will last for 20 years, with a maintenance cost of $500 per year and have a salvage value of $10,000 at the end of 20 years. The estimated salvage value of the new bridge after 20 years of service is $15,000. The maintenance of the new bridge will be $100 per year. If interest is 6%, determine: (a) the present worth of the cost of strengthening the existing bridge. (b) the present worth of the cost of the new bridge. (c) which of the two alternatives is the more economical.	(a) $ 24,617 (b) $ 36,470 (c) The more economical alternative is (circle one): (i)<Strengthen existing> (ii) Build New