KENTUCKY EARLY MATHEMATICS TESTING PROGRAM
FALL 2008/SPRING 2009 TEST
PLEASE NOTE: *Figures are not drawn to scale*

1. For some real number m, the graph of the line $y = mx + 3$ passes through the point (2,-1). What is the slope of this line?

A. 2 **B.** -2 **C.** 1 **D.** 3 **E.** -1

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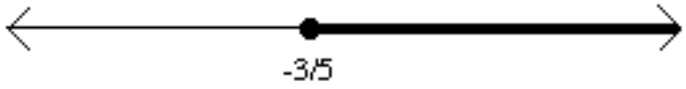
2. Which of the following inequalities has the solution set corresponding to the bold portion of the number line below?

A. $5x > -3$ **B.** $-5x \leq 3$ **C.** $5x \leq -3$ **D.** $-5x \geq -3$ **E.** $-5x > 3$



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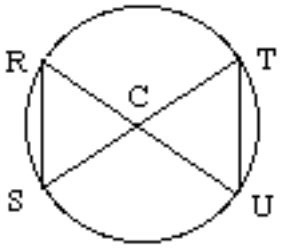
3. In the circle shown below, C is the center and lies on the diagonals $\overline{RU}$ and $\overline{ST}$. If angle TCR is 130 degrees, what is angle CRS in degrees?

A. 50 **B.** 60 **C.** 65 **D.** 75 **E.** 80



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4. Which of the following is the greatest common factor of the two terms in the expression $24x^5 - 18x^2$?

A. $6x^2$ **B.** 6 **C.** x^2 **D.** $3x^2$ **E.** $6x$

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5. Which of the following is a factor of $x^2 - 4x - 12$?

A. $x - 2$ **B.** $x - 6$ **C.** $x + 6$ **D.** $x - 4$ **E.** $x + 3$

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6. The volume V of a sphere of radius r is $V = \frac{4}{3}\pi r^3$. If the radius of a sphere with volume 100π is doubled, then which of the following is the volume of the resulting sphere?

A. 200π **B.** 400π **C.** 600π **D.** 800π **E.** 1600π

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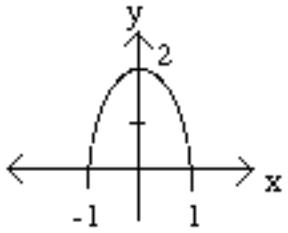
7. Which of the following is the equation of the parabola whose graph is shown below?

A. $y = -2x^2 + 2$ **B.** $y = -x^2 + 2$ **C.** $y = 2x^2 - 2$ **D.** $y = x^2 + 2$ **E.** $y = -2x^2 - 2$



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8. Which of the following is an equivalent form of $\frac{2}{a} - \frac{1}{b}$?

A. $\frac{1}{a-b}$ **B.** $\frac{1}{ab}$ **C.** $\frac{2a-b}{ab}$ **D.** $\frac{2b-a}{a-b}$ **E.** $\frac{2b-a}{ab}$

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9. Which of the following is a simplified form of $(2^3 a^{-4})^2$?

A. $-64a^8$ **B.** $\frac{64}{a^8}$ **C.** $\frac{32}{a^6}$ **D.** $-8a^6$ **E.** $\frac{8}{a^8}$

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10. The graphs of the lines $y = 3 - x$ and $x = -2$ intersect at a point. What is the y-coordinate of that point?

A. -2 B. 0 C. 1 **D.** 3 **E.** 5

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11. In simplified form, $2(x^2 - 3x) - 3x(x - 4)$=?

A. $-x^2 - 18x$ **B.** $5x^2 - 18x$ **C.** $5x^2 + 6x$ **D.** $-x^2 + 6x$ **E.** $-x^2 - 6x$

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12. If $f(x) = |2x - 4|$, then $f(-3)$=?

A. -10 **B.** -2 **C.** 2 **D.** 3 **E.** 10

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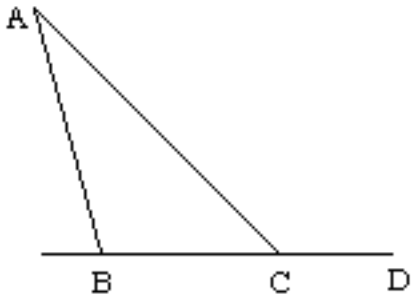
13. In the figure below, the measure of angle BAC is 30 degrees and angle ACD is 135 degrees. What is the measure, in degrees, of angle ABC?

A. 15 **B.** 45 **C.** 105 **D.** 110 **E.** 115



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14. If x dollars is invested in a savings account earning 2% annual interest and y dollars is invested in another savings account earning 3% annual interest, then which of the following expressions represents the annual interest earned, in dollars, on both accounts combined after one year?

A. $.05(x+y)$ **B.** $2x+3y$ **C.** $5(x+y)$ **D.** $.2x+.3y$ **E.** $.02x+.03y$

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15. If $2x+9=23$, then $3x$=?

A. 7 **B.** 14 **C.** 16 **D.** 21 **E.** 48

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16. In simplified form, $\frac{6a^4-2a}{2a}$=?

A. $3a^3-1$ **B.** $6a^4-1$ **C.** $3a^3-2a$ **D.** $6a^4$ **E.** $3a^3$

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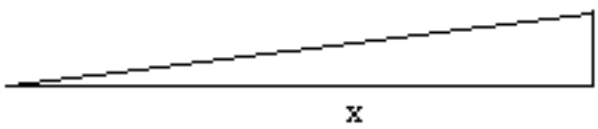
17. A wheelchair ramp is built on level ground and has a 5% grade (that is, the ramp rises 5 feet vertically for every 100 feet of horizontal distance) as shown. If the ramp rises 2 vertical feet, what is the horizontal distance x, in feet, between the ends of the ramp?

A. 4 **B.** 10 **C.** 40 **D.** 100 **E.** 400



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18. A rectangular field is 30 feet wide and is enclosed by 220 feet of fencing. What is the area of the field in square feet?

A. 80 **B.** 190 **C.** 2400 **D.** 5700 **E.** 6600

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19. A 40-foot wire stretches from the top of a building to a point on the ground 20 feet from the base of the building. If the ground is level and forms a right angle with the building, what is the height, in feet, of the building? Round your answer to the nearest foot.

A. 20 **B.** 30 **C.** 35 **D.** 40 **E.** 45

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20. Which of the following is the set of all solutions to the equation $2x^2 + 5x - 3 = 0$?

A. $\{-3\}$ **B.** $\{1/2\}$ **C.** $\{-1/2, -3\}$ **D.** $\{-1/2, 3\}$ **E.** $\{1/2, -3\}$

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21. If a rectangle has a diagonal of length 80 meters, and the angle between the diagonal and one of the sides is 34 degrees, which of the following expressions represents the length of that side, in meters?

A. $80\cos(34^\circ)$ **B.** $80\sin(34^\circ)$ **C.** $80\tan(34^\circ)$ **D.** $\dfrac{80}{\cos(34^\circ)}$ **E.** $\dfrac{80}{\sin(34^\circ)}$

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22. If the graph of $y = x^2$ is translated 3 units to the right and 2 units down in the standard coordinate system, then the translated graph has which of the following equations?

A. $y = (x-3)^2 + 2$ **B.** $y = (x+3)^2 + 2$ **C.** $y = (x+3)^2 - 2$
D. $y = (x+2)^2 + 3$ **E.** $y = (x-3)^2 - 2$

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23. A number cube with sides numbered 1, 2, 3, 4, 5, 6 is rolled twice. What is the probability that the top side of each cube is a 3 both times?

A. $\dfrac{1}{6}$ **B.** $\dfrac{2}{6}$ **C.** $\dfrac{1}{12}$ **D.** $\dfrac{1}{36}$ **E.** $\dfrac{2}{36}$

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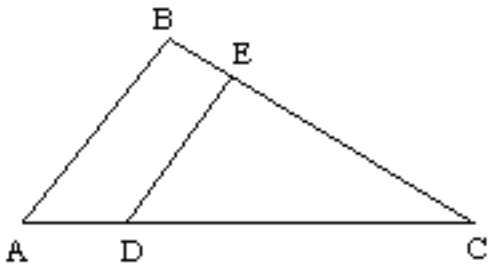
24. In the figure below, $\overline{AB}$ is parallel to $\overline{DE}$, $\overline{AB}$ has length 4 feet, $\overline{DE}$ has length 3 feet, and $\overline{DC}$ has length 8 feet. What is the length of $\overline{AC}$? Round your answer to the nearest tenth of a foot.

A. 9.9 **B.** 10.1 **C.** 10.3 **D.** 10.5 **E.** 10.7



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25. What is the slope of the line with equation $3x + 2y = 7$?

A. $\frac{2}{3}$ **B.** $-\frac{2}{3}$ **C.** $\frac{3}{2}$ **D.** $-\frac{3}{2}$ **E.** $\frac{7}{2}$
