CCM2 Final Exam Review

Name: _____ **Date:** _____

1. Evaluate: $(27)^{2/3}$

   A. 9 B. 36 C. 54 D. 81

2. Simplify: $\sqrt{48}$

   A. $4\sqrt{3}$ B. $5\sqrt{3}$ C. $2\sqrt{12}$ D. $4\sqrt{12}$

3. Simplify: $\sqrt{64a^4b^2c^8}$

   A. $32a^2bc^4$ B. $32a^4b^2c^8$

   C. $8a^2bc^4$ D. $8a^2bc^2$

4. Simplify: $\sqrt[3]{-8a^{15}b^6}$

   A. $-8a^5b^2$ B. $-2a^5b^2$

   C. $2a^{15}b^6$ D. $4a^5b^2$

5. Simplify: $\sqrt{54} + \sqrt{24}$

   A. $10\sqrt{3}$ B. $5\sqrt{6}$ C. $6\sqrt{6}$ D. $7\sqrt{6}$

6. Simplify: $9\sqrt{6} - 3\sqrt{24}$

   A. $6\sqrt{2}$ B. $9\sqrt{2}$ C. $3\sqrt{6}$ D. $15\sqrt{6}$

7. Simplify: $\sqrt{8} \cdot \sqrt{10}$

   A. $2\sqrt{10}$ B. $4\sqrt{5}$ C. $5\sqrt{4}$ D. 80

8. Simplify: $(2 + \sqrt{5})(4 - \sqrt{5})$

   A. $3 + 6\sqrt{5}$ B. $3 + 2\sqrt{5}$

   C. $13 + 2\sqrt{5}$ D. $13 + 6\sqrt{5}$

9. What is $-13p^4q^{-2}$ divided by $26p^{-3}q^5$?

   A. $-\frac{p}{2q^7}$ B. $-\frac{p^7}{2q^7}$ C. $-\frac{p^7}{2q^3}$ D. $-\frac{p}{2q^7}$

10. Simplify: $\left(2y^4\right)^2$

    A. $4y^4$ B. $4y^8$ C. y^{16} D. y^8

11. Factor completely: $18x^2 - 63x$

    A. $3x(6x - 21)$ B. $9(2x^2 - 7x)$

    C. $9x(2x - 8)$ D. $9x(2x - 7)$

12. Factor completely: $-x^2 + 5x - 6$

    A. $(x - 3)(x - 2)$ B. $(x - 3)(2 - x)$

    C. $(x + 6)(x - 1)$ D. $(x - 1)(6 - x)$

13. Factor: $6x^2 - x - 5$

A. $(6x - 5)(x + 1)$ B. $(6x + 5)(x - 1)$

C. $(2x - 5)(3x + 1)$ D. $(2x + 5)(3x - 1)$

14. Find one of the factors of: $25h^2 + 20h + 4$

A. $(5h + 1)$ B. $(h + 1)$

C. $(5h + 2)$ D. $(5h - 1)$

15. Factor completely: $12x^2 + 5xy - 28y^2$. Then, identify one of the following as an incomplete version of the correctly factored form.

A. $(\quad)(3x+\quad)$ B. $(4x+\quad)(\quad)$

C. $(\quad -7y)(\quad)$ D. $(\quad)(\quad -14y)$

16. An evolutionary biology research team is studying common ancestors between species. DNA samples from four different animals are analyzed using gel electrophoresis. The results are converted by a computer program into polynomials.

Butterfly:	$3x^2 + 10x - 8$	Bat:	$4x^2 - 9$
Hummingbird:	$6x^2 - 13x + 6$	Dragonfly:	$3x^2 + 14x + 8$

a) Factor the computerized polynomials below.

Butterfly: _____ Bat: _____

Hummingbird: _____ Dragonfly: _____

b) Common factors indicate common ancestors. Which animals have common ancestors?

17. Simplify: $\dfrac{x^2 - 2x - 15}{x^2 - 8x + 15}$

A. -2 B. $\dfrac{x+5}{x+3}$ C. $\dfrac{x-3}{x+3}$ D. $\dfrac{x+3}{x-3}$

18. The length of a rectangle is 12 more than the width. The area is 325. Which equation best represents the situation if W represents the width of the rectangle?

A. $w^2 + 325w + 12 = 0$

B. $w^2 - 12w - 325 = 0$

C. $w^2 + 12w - 325 = 0$

D. $w^2 - 325w + 12 = 0$

19. Solve: $\sqrt{x} = 9$

A. -3 B. 3 C. 36 D. 81

20. Solve: $\dfrac{3}{x^2+x-2} + \dfrac{3}{x-1} = \dfrac{1}{x+2}$

A. -3 B. -5 C. 2 D. 5

21. Solve: $\sqrt{2x} + 5 = 9$

A. 7 B. 8 C. 22 D. Ø

22. Solve: $\sqrt{4x} = 2$

A. 1 B. 2 C. 16 D. Ø

23. Solve: $\dfrac{1}{20} = \dfrac{\sqrt{b}}{5}$

A. $\frac{1}{4}$ B. $\frac{5}{16}$ C. $\frac{1}{20}$ D. $\frac{1}{16}$

24. This equation represents what type of function?

$y = 4^{x+1}$

A. quadratic B. exponential

C. absolute value D. cubic

25. Given $f(x) = -4(x-5)^2 + k$. Which of the following ranges are impossible for $f(x)$?

A. $y \le 0$ B. $y \le 4$ C. $y \le 5$ D. $y \ge 5$

26. What is the domain of the quadratic relation $x = -(y-4)^2 + 2$?

A. $x \le -4$ B. $x \ge -4$

C. $x \le 2$ D. $x \le 4$

27. What is the domain of the function?

$$f(x) = 7 - \frac{3}{x-2}$$

A. all real numbers

B. all real numbers less than or equal to 7

C. all real numbers except 2

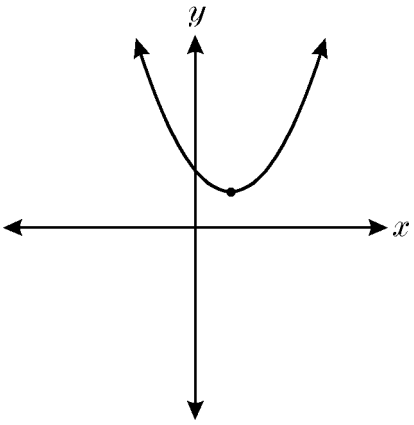
D. all real numbers except 7

28. State the range and domain of the function $y = \dfrac{1}{x} + 3$

29. State the domain of

$y = \log_2(3x+1)$

30. How many solutions are shown by the graph of the quadratic function?



A. zero B. one C. two D. three

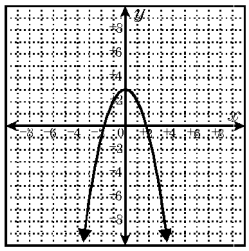
31. Given the graph, determine the number of real solutions.

A. no solution

B. one solution

C. two solutions

D. not enough information



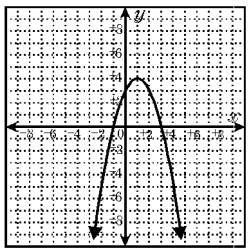
32. What are the roots of the function whose graph is shown?

A. $\{-1, 3\}$

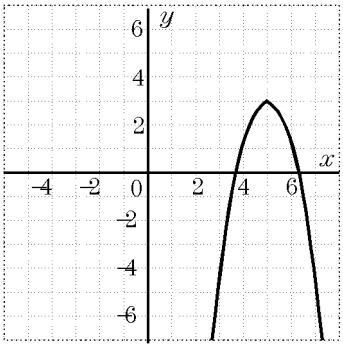
B. $\{1, 4\}$

C. $\{3\}$

D. $\{-1\}$



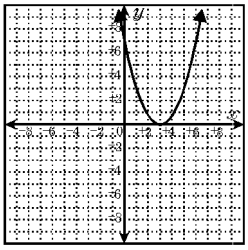
33. In the diagram, is the vertex a maximum or minimum point? What are the coordinates of the vertex?



A. minimum; $(5, 3)$ B. maximum; $(5, 3)$

C. maximum; $(5, -3)$ D. minimum; $(5, -3)$

34. State the vertex and x-intercept(s) of the given graph.



A. vertex: $(7, 0)$ x-intercept(s): 3

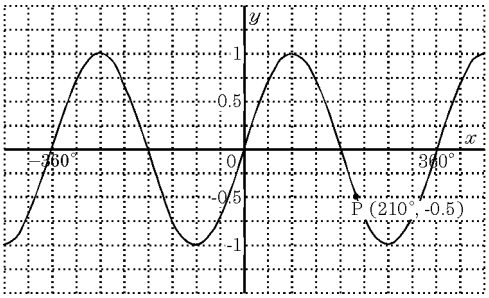
B. vertex: $(3, 0)$ x-intercept(s): 3

C. vertex: $(0, 3)$ x-intercept(s): 3

D. vertex: $(0, 7)$ x-intercept(s): 3

35. The grid shows the coordinates of one point on the graph of $y = \sin x$.

Write the x-coordinates of four other points on the graph that have the same y-coordinate as this point.



A. $-150°, -30°, 30°, 150°$

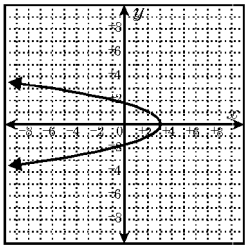
B. $-30°, 30°, 150°, 330°$

C. $-390°, -150°, -30°, 330°$

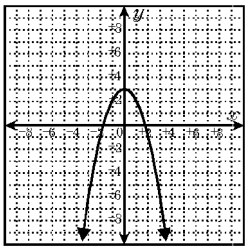
D. $-390°, -150°, 150°, 390°$

36. Which of the following is the graph of $y = x^2 - 3$?

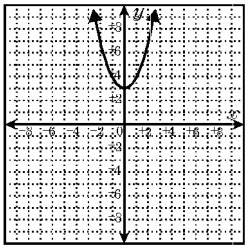
A.



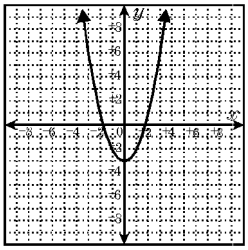
B.



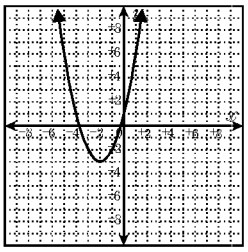
C.

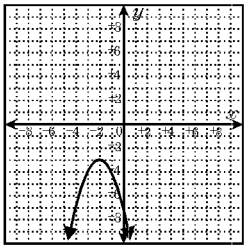


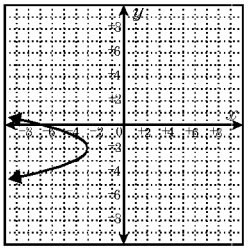
D.

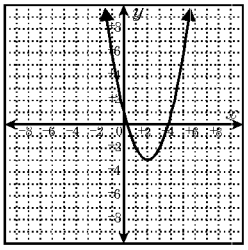


37. Which of the following is the graph of $y = -(x + 2)^2 - 3$?

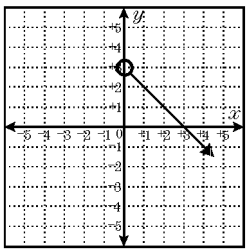
A. 

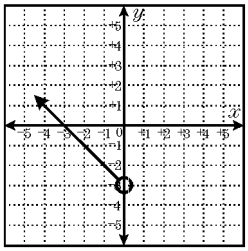
B. 

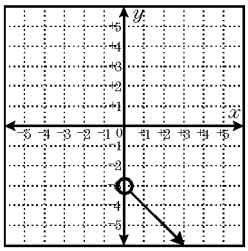
C. 

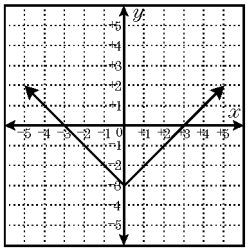
D. 

38. If x is a *negative real number*, which of the following graphs is the graph of $y = |x| - 3$?

A. 

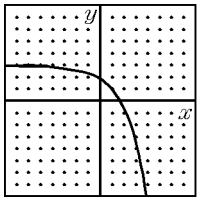
B. 

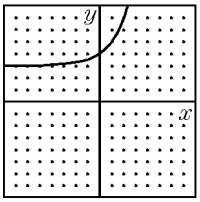
C. 

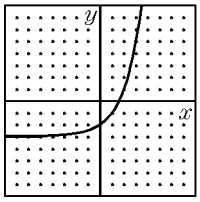
D. 

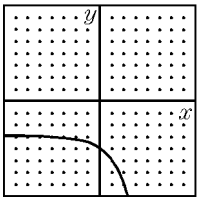
39. Graph $f(x) = \begin{cases} -x^2 & \text{if } x < 0, \\ 2 & \text{if } x = 0, \\ 3x - 1 & \text{if } x > 0, \end{cases}$

40. Which one of the following sketches is a reasonable graph of $y = -2^x - 3$?

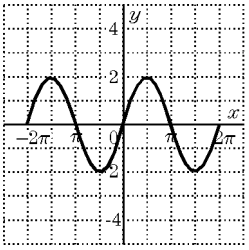
A. 

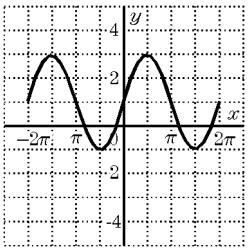
B. 

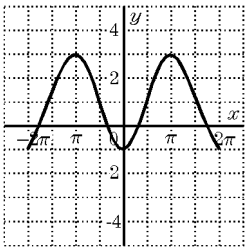
C. 

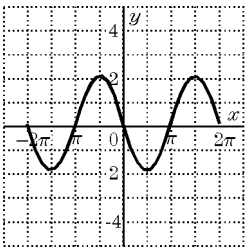
D. 

41. The graph of the function $y = -2\cos x + 1$ where $-2\pi \le x \le 2\pi$ is best pictured as:

A. 

B. 

C. 

D. 

42. The graph of $y = 3^x$:

A. intersects the x-axis only

B. intersects the y-axis only

C. intersects both coordinate axes

D. does not intersect either axis

43. What is the equation of the inverse of $y = \frac{1}{x-4}$?

A. $y = x - 4$ B. $y = \frac{1}{x} + 4$

C. $y = \frac{1}{x} - 4$ D. $y = -\frac{1}{x-4}$

44. Select the letters that would appear the same after a 180° rotation about the center.

I. A

II. H

III. R

IV. S

A. II only B. III only

C. I and III D. II and IV

45. If a point in Quadrant II is reflected in the y-axis, its image will lie in Quadrant _____.

A. I B. III C. IV

D. on the y-axis

46. What are the coordinates of $(2, 3)$ after a translation down 3 units and then a rotation of 180° in a clockwise direction about $(0, 0)$?

A. $(0, 2)$ B. $(0, -2)$

C. $(-2, 0)$ D. $(2, 0)$

47. $\triangle STV$ has vertices $S(-3, -2)$, $T(-4, 3)$ and $V(-2, 3)$. If $(x, y) \rightarrow (x - 2, y + 3)$, what are the vertices of its image?

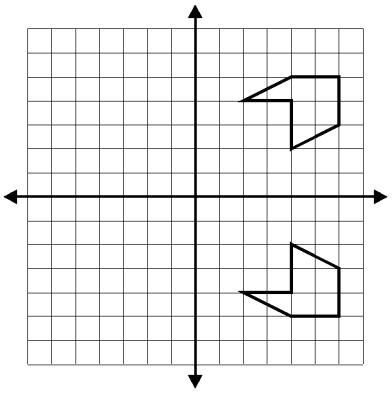
A. $S'(-1, -5)$, $T'(-2, 0)$, $V'(0, 0)$

B. $S'(-5, 1)$, $T'(-6, 6)$, $V'(-4, 6)$

C. $S'(-1, -4)$, $T'(-2, 5)$, $V'(0, 5)$

D. $S'(3, 2)$, $T'(4, -3)$, $V'(2, -3)$

48. Which of the following is the correct mapping for shape A to shape B?



A. $(x, y) \rightarrow (-x, y)$ B. $(x, y) \rightarrow (x, -y)$

C. $(x, y) \rightarrow (-x, y + 2)$ D. $(x, y) \rightarrow (x - 3, y)$

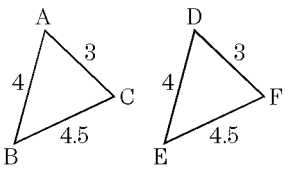
49. State the congruence relation for $\triangle ABC$ and $\triangle DEF$.

A. SSS

B. ASA

C. AAA

D. SAS

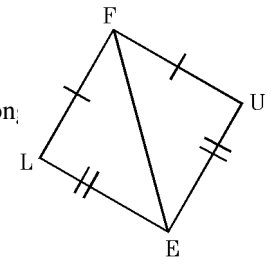


50. State the congruence relation for $\triangle FLE$ and $\triangle FUE$.

A. ASA B. AAA

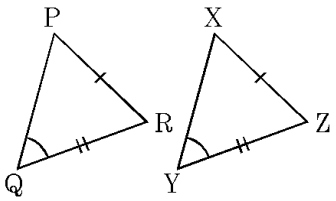
C. SSS

D. not necessarily con

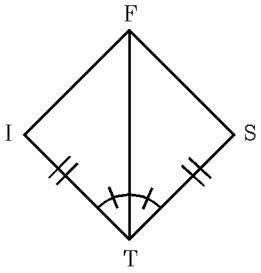


51. Which diagrams show that the two triangles *must* be congruent?

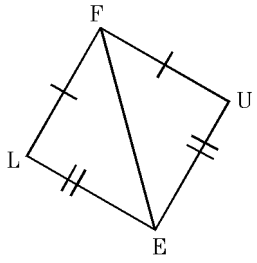
I.



II.



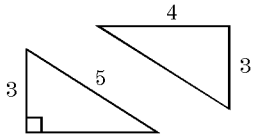
III.



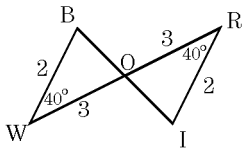
A. I only B. II only C. I and II only D. II and III only

52. Which diagrams show that the two triangles *must* be congruent?

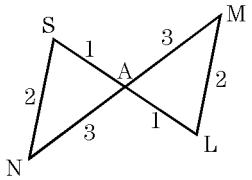
I.



II.



III.



A. II only B. I and II only

C. II and III only D. I, II and III

53. Which of the following statements *must* be true?

I. All congruent triangles are similar.

II. All similar triangles are congruent.

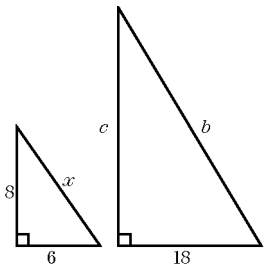
III. All right triangles are similar.

IV. All isosceles right triangles are similar.

A. I only B. I and II only

C. III only D. I and IV only

54. Given the information in the diagram, do the triangles have to be similar?



A. Yes. The right triangle is 3 times the size of the left triangle.

B. Yes. All scalene triangles are similar

C. No. Side c is not necessarily 24.

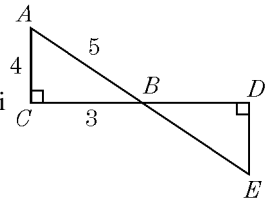
D. No. Scalene triangles are never similar.

55. Given $\triangle ABC \cong \triangle EBD$, how long is $\overline{DE}$?

A. 3 B. 4

C. 5

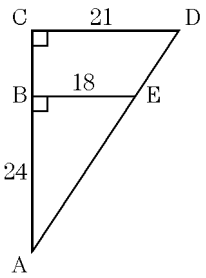
D. cannot be determi



56. In the diagram, $\overline{CD} \perp \overline{AC}$, $\overline{BE} \perp \overline{AC}$, $AB = 24$, $BE = 18$, and $CD = 21$. Find BC.

A. 4 B. 24

C. 30 D. 35



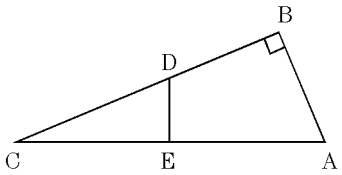
57. Triangle ABC is a right triangle. $\overline{DE}$ is perpendicular to $\overline{AC}$ and bisects $\overline{AC}$. If $AB = 10$ and $BC = 24$, then how long is $\overline{DE}$?

A. 5

B. $5\frac{5}{12}$

C. 12

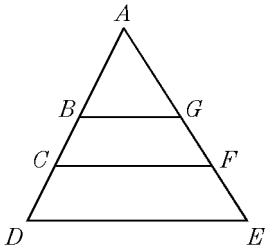
D. $33\frac{4}{5}$



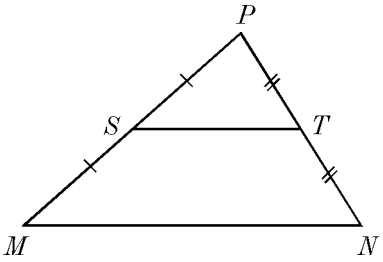
58. B and G are midpoints of $\overline{AD}$ and $\overline{AE}$, and C and F are midpoints of $\overline{BD}$ and $\overline{GE}$. If $BG = 9$, find the length of $\overline{CF}$.

A. 4.5 B. 13.5

C. 18 D. 27



59.



Determine the length of $\overline{MN}$ if $\overline{ST}$ is $(3x + 2)$ units.

A. $6x + 4$ B. $6x + 2$

C. $3x + 1$ D. $\frac{3x + 2}{2}$

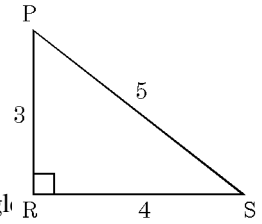
60. Which of the following statements is *incorrect* for the given diagram?

A. $\cos S = \frac{4}{5}$

B. $\tan P = \frac{4}{3}$

C. $\tan S = \frac{5}{4}$

D. $\triangle PRS$ is a right triangl



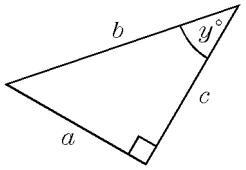
61. Identify the statement that is *incorrect*.

A. $\sin y^\circ = \frac{a}{b}$

B. $\tan y^\circ = \frac{a}{c}$

C. $\tan(90^\circ - y^\circ) = \frac{a}{c}$

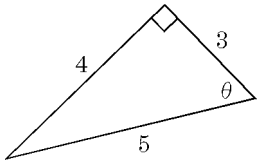
D. $c^2 + a^2 = b^2$



62. Given the following triangle, $\cos\theta =$ _____

A. $\frac{3}{5}$ B. $\frac{3}{4}$

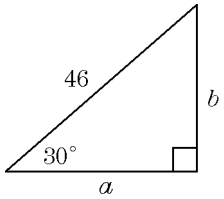
C. $\frac{4}{3}$ D. $\frac{5}{3}$



63. Find b.

A. 92 B. 76

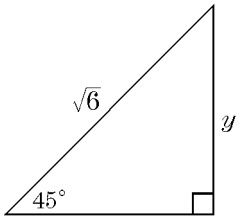
C. 23 D. 16



64. Find the exact value of y.

A. $\sqrt{3}$ B. $2\sqrt{2}$

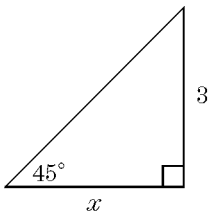
C. $2\sqrt{3}$ D. $2\sqrt{6}$



65. Find the area of the triangle.

A. $\frac{3}{2}$ B. 4.5

C. 9 D. 12



66. A certain ophthalmic trait is associated with eye color. 300 randomly selected individuals are studied with results as follows:

EYE COLOR

TRAIT	Blue	Brown	Other	Total
Yes	70	30	20	120
No	20	110	50	180
Total	90	140	70	300

What would you expect to be the value P(having the trait and blue eyes) if eye color and trait status were independent?

67. Which of the following are always true?

I. $P(A \text{ and } B) = P(A) \times P(B)$

II. $P(A \text{ and } B) = P(A) + P(B)$

III. $P(A \text{ and } B) = P(A) \times P(B|A)$

A. I only B. II only

C. III only D. II and III only

68. If A and B are mutually exclusive events, then:

A. $n(A \cap B) = n(A) = n(B)$

B. $n(A \cap B) = n(A) - n(B)$

C. $A \cup B = \emptyset$

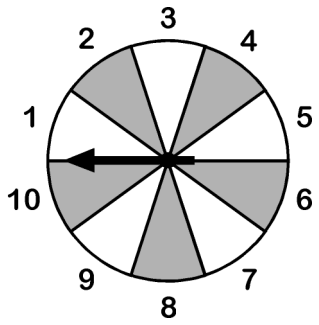
D. $A \cap B = \emptyset$

69. A spinner is divided into ten numbered sections, as shown. (Assume the arrow never lands on a dividing line.)

With only one spin, what is the probability that the arrow lands on an unshaded section or points to an even number?

A. 0 B. $\frac{1}{5}$

C. $\frac{1}{2}$ D. 1



70. A card is drawn at random from a standard 52-card deck. Find the probability it is a face card or black card.

A. $\frac{7}{13}$ B. $\frac{8}{13}$ C. $\frac{17}{26}$ D. $\frac{7}{52}$

CCM2 Final Exam Review 01/10/2014

1.
Answer: A
Objective: N.RN.02

2.
Answer: A
Objective: N.RN.02

3.
Answer: C
Objective: N.RN.02

4.
Answer: B
Objective: N.RN.02

5.
Answer: B
Objective: N.RN.02

6.
Answer: C
Objective: N.RN.02

7.
Answer: B
Objective: N.RN.02

8.
Answer: B
Objective: N.RN.02

9.
Answer: B
Objective: N.RN.02

10.
Answer: B
Objective: A.SSE.02

11.
Answer: D
Objective: A.SSE.03A

12.
Answer: B
Objective: A.SSE.03A

13.
Answer: B
Objective: A.SSE.03A

14.
Answer: C
Objective: A.SSE.03A

15.
Answer: B
Objective: A.SSE.03A

16.
Answer: Butterfly: $(x + 4)(3x - 2)$, Bat: $(2x + 3)(2x - 3)$, Hummingbird: $(3x - 2)(2x - 3)$, Dragonfly: $(3x + 2)(x + 4)$; Butterfly and Hummingbird, Butterfly and Dragonfly, Bat and Hummingbird
Objective: A.SSE.03A

17.
Answer: D
Objective: A.APR.06

18.
Answer: C
Objective: A.CED.01

19.
Answer: D
Objective: A.REI.02

20.
Answer:
Objective: A.REI.02

21.
Answer: B
Objective: A.REI.02

22.
Answer: A
Objective: A.REI.02

23.
Answer: D
Objective: A.REI.02

24.
Answer: B
Objective: F.IF.01

25.
Answer: D
Objective: F.IF.01

26.
Answer: C
Objective: F.IF.01

27.
Answer: C
Objective: F.IF.01

28.
Answer: $x \neq 0$ and $y \neq 3$
Objective: F.IF.01

29.
Answer: $x > -\frac{1}{3}$
Objective: F.IF.01

30.
Answer: A
Objective: F.IF.04

31.
Answer: C
Objective: F.IF.04

32.
Answer: A
Objective: F.IF.04

33.
Answer: B
Objective: F.IF.04

34.
Answer: B
Objective: F.IF.04

35.
Answer: C
Objective: F.IF.04

36.
Answer: D
Objective: F.IF.07A

37.
Answer: B
Objective: F.IF.07A

38.
Answer: B
Objective: F.IF.07B

39.
Answer: [graph]
Objective: F.IF.07B

40.
Answer: D
Objective: F.IF.07E

41.
Answer: C
Objective: F.IF.07E

42.
Answer: B
Objective: F.IF.07E

43.
Answer: B
Objective: F.BF.04A

44.
Answer: D
Objective: G.CO.02

45.
Answer: A
Objective: G.CO.02

46.
Answer: C
Objective: G.CO.02

47.
Answer: A
Objective: G.CO.06

48.
Answer: B
Objective: G.CO.06

49.
Answer: A
Objective: G.CO.07

50.
Answer: C
Objective: G.CO.07

51.
Answer: D
Objective: G.CO.07

52.
Answer: C
Objective: G.CO.07

53.
Answer: D
Objective: G.SRT.02

54.
Answer: C
Objective: G.SRT.02

55.
Answer: B
Objective: G.SRT.05

56.
Answer: A
Objective: G.SRT.05

57.
Answer: B
Objective: G.SRT.05

58.
Answer: B
Objective: G.SRT.05

59.
Answer: A
Objective: G.SRT.05

60.
Answer: C
Objective: G.SRT.06

61.
Answer: C
Objective: G.SRT.06

62.
Answer: A
Objective: G.SRT.08

63.
Answer: C
Objective: G.SRT.08

64.
Answer: A
Objective: G.SRT.08

65.
Answer: B
Objective: G.SRT.08

66.
Answer: $(120/300) * (90/300) = 0.12$
Objective: S.CP.02

67.
Answer: C
Objective: S.CP.03

68.
Answer: D
Objective: S.CP.03

69.
Answer: D
Objective: S.CP.07

70.
Answer: B
Objective: S.CP.07