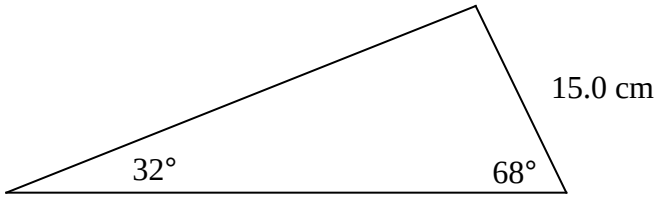
MA 154 Exam 3 Fall 2002

This exam covers Sections 7.6 (starting with question 19), 8.1, 8.2, 8.5, 8.6, and 4.5 (up to question 24).

1. Find the perimeter of the triangle. Round to the nearest tenth of a centimeter.

A. 69.1 cm B. 41.2 cm C. 42.9 cm D. 57.7 cm E. None of these.

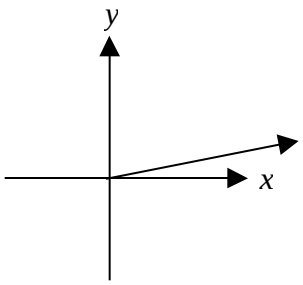


2. Find the angle between the vectors $\langle 5, 2 \rangle$ and $\langle -3,1 \rangle$. Round to the nearest tenth of a degree.

A. 139.8° B. 27.8° C. 40.2° D. 152.2° E. None of these.

3. Given $a = \langle 2, -5 \rangle$ and $b = \langle -3, 4 \rangle$, which of the following best represents $2a + 3b$?

A.



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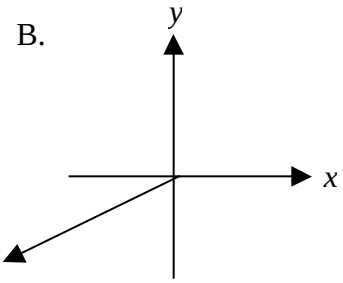
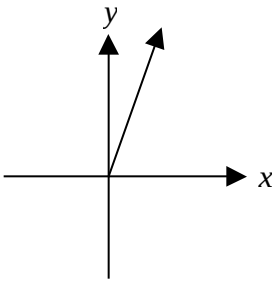
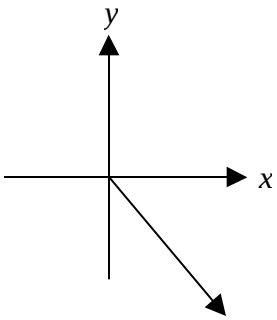


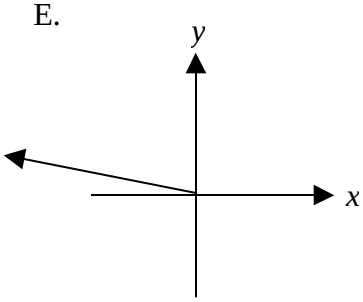
C.



D.



E.



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4. Complete the statement:

For the function $f(x) = \dfrac{12x^2 - x - 6}{4x^2 - 9}$, as $x \to \infty, f(x) \to$ _____

A. 0 B. 1 C. 4 D. $\dfrac{2}{3}$ E. None of these.

5. Determine *m* such that the two vectors are orthogonal.

$a = 9i + 3j, \quad b = 2i - 3mj$

A. $m = 4.5$ B. $m = -2$ C. $m = -4.5$ D. $m = 2$ E. None of these.

6. The magnitudes and directions of two forces acting at a point *P* are given. Approximate the magnitude of the resultant force to the nearest tenth of a kilogram.

(*a*) 50 kg, 280° (*b*) 90 kg, 70°

A. 41.8 kg B. 53.0 kg C. 17.6 kg D. 135.6 kg E. None of these.

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7. Write the expression as an algebraic expression in x for $x > 0$.

$$\sin\left[2\tan^{-1}\left(\frac{7}{x}\right)\right]$$

A. $\dfrac{14x}{\sqrt{x^2+49}}$ B. $\dfrac{2x}{x+7}$ C. $\dfrac{2x}{\sqrt{x^2+49}}$ D. $\dfrac{14x}{x^2+49}$ E. None of these.

8. Find the solutions of the equation that are in the given interval. Round to four decimal places.

$$3\tan^2 t - 9\tan t - 5 = 0 \qquad \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$$

A. 4.4325, – 2.6948 B. 1.2560, – 0.5236 C. 1.2909, – 0.4468

D. 1.1548, – 0.6346 E. No Solutions

9. Given ΔABC with $\gamma = 45°$, $c = 12.0$ and $b = 16.7$, one possible value of a is 13.9. Which of the following best describes the other possible value of a?

A. between 4 and 5 B. between 24 and 25 C. between 14 and 15

D. between 9 and 10 E. between 12 and 13

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10. An airplane, flying at 125 miles per hour, flies from point *A* in the direction 100° for 2 hours and then, without changing speed, travels in the direction 210° for a half-hour. Approximately how far is the airplane from point *A*?

A. 247 miles B. 258 miles C. 236 miles D. 268 miles E. None of these.

11. A forest ranger at an observation point *A* sights a fire in the direction S51°E. Another ranger at an observation point *B* sights the same fire at S23°W. If point B is 9.2 miles due east of point A, approximate the distance from observation point *A* to the fire.

A. 6.0 miles B. 8.8 miles C. 3.7 miles D. 7.4 miles E. None of these.

12. Two joggers, starting at the same point, run along straight paths that differ in direction by an unknown angle. If their speeds are 7 km/hr and 11 km/hr, respectively, and they are 3 km apart after 15 minutes, what is the smallest angle between the two paths?

A. 64.6° B. 35.1° C. 99.7° D. 80.3° E. None of these.

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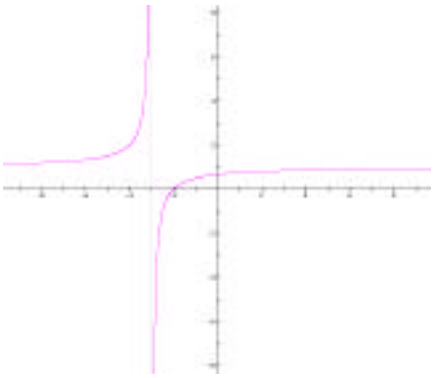
13. Which of the following most closely resembles the graph of $f(x) = \dfrac{x-4}{x^2+x-6}$?

A.



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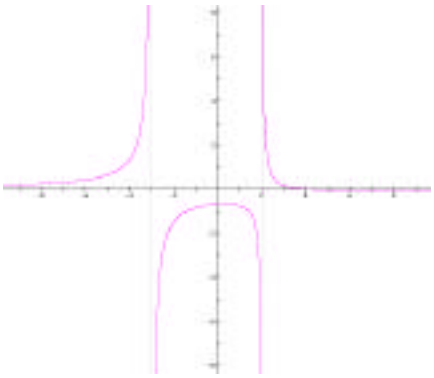

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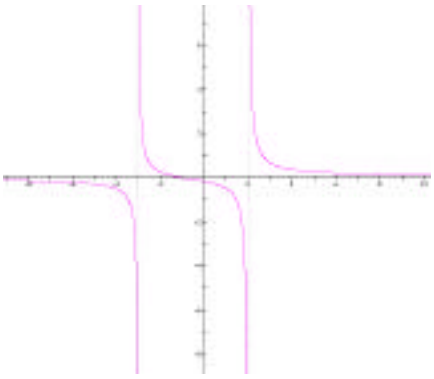
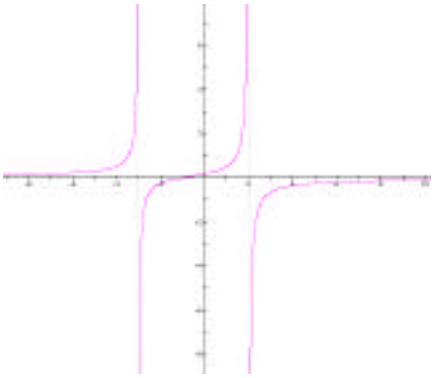
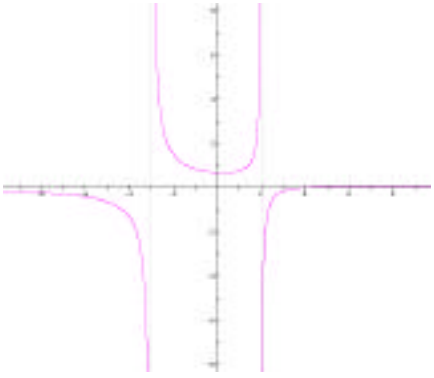


D.



E.



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MA 154, Fall 2002
Exam 3 Answers

Question	Letter	Answer
1.	A	69.1 cm
2.	A	139.8°
3.	E	The graph of the vector < –5, 2 >
4.	E	None of these Horizontal asymptote = 3
5.	D	$m = 2$
6.	B	53.0 kg
7.	D	$\frac{14x}{x^2 + 49}$
8.	C	1.2909, – 0.4468
9.	D	$a = 9.7$
10.	C	236 miles
11.	B	8.8 miles
12.	D	80.3°
13.	E