1. Factor completely: $m^4 - 16t^4$

A. $\left(m^2 + 8t^2\right)\left(m^2 - 8t^2\right)$
B. $\left(m^2 + 4t^2\right)^2$
C. $\left(m^2 + 8t^2\right)(m + 4t)(m - 4t)$
D. $\left(m^2 + 4t^2\right)(m - 2t)(m + 2t)$
E. $\left(m^2 - 4t^2\right)^2$

2. Perform the indicated operations and simplify:

$$\frac{3x+2}{4-x} + \frac{5-3x}{x-4}$$

A. $\frac{-3x}{x-4}$
B. $\frac{3-6x}{x-4}$
C. $\frac{7+6x}{4-x}$
D. $\frac{3-6x}{4-x}$
E. $\frac{-6x+7}{x-4}$

3. Express this quotient in simplest form.

$$\frac{4 - \frac{1}{y^2}}{\frac{1}{y} + 2}$$

A. $\frac{4y^2 - 1}{3y^2}$
B. $\frac{1}{y}$
C. $\frac{4y^2 - 1}{1 + 2y^2}$
D. $\frac{2y - 1}{y + 2y^2}$
E. None of these.

4. One factor of $12a^2 + 10a - 42$ is:

A. $2a - 3$

B. $2a$

C. $2a + 3$

D. $3a - 7$

E. $6a^2 + 5a + 21$

5. Perform the indicated operations and simplify:

$$\frac{x^2 + 4x}{x^2 - 16} \div \frac{x - 4}{x + 4}$$

A. $\dfrac{x(x+4)}{(x-4)^2}$

B. $\dfrac{x-4}{-4(x+4)}$

C. $\dfrac{x}{(x-4)^2}$

D. $\dfrac{x}{x+4}$

E. None of these.

6. Solve for a.

$$\frac{6}{a+4} = \frac{5}{2a-1}$$

A. $a = \dfrac{14}{17}$

B. $a = \dfrac{19}{16}$

C. $a = \dfrac{29}{4}$

D. $a = 5$

E. $a = \frac{26}{7}$

7. How many liters of a 20% solution of a chemical should be mixed with 10 liters of a 50% solution to get a 40% mixture?

A. $\frac{40}{7} l$

B. $5l$

C. $10l$

D. $\frac{5}{2} l$

E. None of these.

8. Solve for x.

$$\frac{3}{4}x - \frac{7}{10} = \frac{1}{5}x + \frac{1}{2}$$

A. $x = \frac{24}{11}$

B. $x = \frac{4}{9}$

C. $x = -\frac{24}{11}$

D. $x = -\frac{27}{16}$

E. $x = -\frac{4}{9}$

9. Solve for a.

$$3a - 2b = \frac{16}{3}$$
$$2a + 3b = 5$$

A. $a = \frac{2}{3}$

B. $a = 3$

C. $a = 2$

D. $a = \frac{1}{3}$

E. $a = 26$

10. Solve for x. $2x^2 + 27x = -13$

A. $x = 2, 13$

B. $x = -2, -13$

C. $x = -\frac{1}{2}, -13$

D. $x = \frac{1}{2}, 13$

E. $x = -2, 13$

11. Solve the following inequality: $|3x - 4| \le 8$.

A. $\{x : x \le 4\}$

B. $\left\{x : -\frac{4}{3} \le x \le 12\right\}$

C. $\left\{x : -\frac{4}{3} \le x \le \frac{8}{3}\right\}$

D. $\{x : -4 \le x \le 12\}$

E. $\left\{x : -\frac{4}{3} \le x \le 4\right\}$

12. One solution of the equation $x^2 + 3x - 9 = 0$ is:

A. $x = -\frac{3}{2} + \frac{3}{2}\sqrt{5}$

B. $x = -\frac{3}{2} - 3\sqrt{3}$

C. $x = \frac{3}{2} + 3\sqrt{5}$

D. $x = -\frac{3}{2} + \frac{3}{2}\sqrt{3}$

E. $x = -\frac{3}{2} + 3\sqrt{5}$

13. Tom takes his motorboat upstream to his favorite fishing spot, a distance of 36 miles, in 2 hours. The return trip of the same distance takes only 1 hour 30 minutes. If the boat travels at top speed in both directions, what is the speed of the current?

A. 21 mph

B. 3 mph

C. 18 mph

D. 2 mph

E. None of these.

14. Clearcall charges \$19 per month plus \$ .10 for each minute of air time for cell phone service. Talknet charges \$12 per month and \$.15 per minute. Set up the inequality that would be used to find all the numbers of minutes in one month for which the Clearcall plan is cheaper. **Do not solve.**

A. $19 + 12x > .10 + .15x$

B. $19 + .10x > 12 + .15x$

C. $19x + 10 < 12x + 15$

D. $19 + .10x < 12 + .15x$

E. None of these.